

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
4-154US-FF

Total Pages in this Submission

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

IMAGE DATA COMMUNICATION SYSTEM, SERVER SYSTEM, METHOD OF CONTROLLING OPERATION OF SAME, AND RECORDING MEDIUM STORING PROGRAM FOR CONTROL OF SERVER SYSTEM

and invented by:

Norihisa Haneda, Yoshinori Ohta, and Keisuke Tanaka

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 86 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal Number of Sheets 37 (Figs. 1-48)
- b. ☐ Informal Number of Sheets _____
4. ☒ Oath or Declaration
- a. ☒ Newly executed *(original or copy)* ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy *(identical to computer copy)*
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☐ Certificate of Mailing
- ☐ First Class ☐ Express Mail *(Specify Label No.):* _____

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Accompanying Application Parts (Continued)

15. ☒ Certified Copy of Priority Document(s) (if foreign priority is claimed)


16. ☐ Additional Enclosures (please identify below):

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	22	- 20 =	2	x \$18.00	\$36.00
Indep. Claims	10	- 3 =	7	x \$78.00	\$546.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$690.00
OTHER FEE (specify purpose) Assignment Recordation					\$40.00
TOTAL FILING FEE					\$1,312.00

- ☒ A check in the amount of \$1,312.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 50-0481 as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).


Signature

Dated: January 13, 2000

Sean M. McGinn, Esq.
Reg. No.: 34,386

CC:

Customer No.: 21254

TITLE OF THE INVENTION

5 STORING PROGRAM FOR CONTROL OF SERVER SYSTEM

Field of the Invention

15 The invention relates further to a registration system for an image database, an image database search system, registration and search methods, and a recording medium storing a program for controlling an image database.

An image data communication system for uploading image data from a client computer to a server system is constructed via a network such as the Internet. By accessing the server system, image data that has been
25 uploaded to the server system is downloaded to the client computer.

If image data containing a large quantity of data is uploaded to the server system, an image printed using

5 download time, the image quality of the image printed
using this image data will decline.

10 keyboard or the like. Thus, means for inputting the
keyword is required.

15 an image database in association with the image data.
 However, such an arrangement requires a special device
 to extract the alphanumeric characters from the image.

SUMMARY OF THE INVENTION

20 to arrange it so that image data possessing a plurality
of image qualities can be uploaded to a server system.

25 database in a comparatively simple manner.

An image data communication system according to the present invention is such that a plurality of client computers and a server system are capable of

communicating with each other via a network.

The client computer has an original-image data specifying unit for specifying original-image data that is to be transmitted to the server system, and an
5 original-image data transmitting unit for transmitting the original-image data, which has been specified by the original-image data specifying unit, to the server system.

The server system has an original-image data
10 receiving unit for receiving the original-image data transmitted from the original-image data transmitting unit; an image data generating unit (image data generating means), which responds to receipt of the original-image data by the original-image data receiving
15 unit, for generating reduced-data-quantity image data of two stages representing at least two images possessing data quantities of at least two stages in each of which the quantity of data is less than that of the original-image data; and a unit (means) for associating the
20 original-image data, which has been received by the original-image data receiving unit, and the reduced-data-quantity image data that has been generated by the image data generating unit.

The present invention provides also a method of
25 controlling the operation of the above-described server system. Specifically, there is provided a method of controlling the operation of a server system capable of communicating with a client computer via a network,

comprising the steps of: receiving original-image data that is sent; generating, in response to receipt of the original-image data, reduced-data-quantity image data of two stages representing at least two images possessing
5 data quantities of at least two stages in each of which the quantity of data is less than that of the original-image data; and associating the original-image data that has been received and the reduced-data-quantity image data that has been generated.

10 The present invention provides also a recording medium storing a program for controlling the operation of the above-described server system.

The original-image data is transmitted from the client computer of the server system.

15 The original-image data is received by the server system, whereupon the server system generates reduced-data-quantity image data of two stages representing at least two images possessing data quantities of at least two stages in which the quantity of data is less than
20 that of the original-image data. The format of the generated reduced-data-quantity image data of two stages may be the same as or different from that of the original-image data. This means that the server system may obtain original-image data representing an original
25 image, medium-image data the quantity of data of which is less than that of the original-image data, and thumbnail-image data the quantity of data of which is less than that of the medium-image data.

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When an image is to be checked at the client computer, a first item of reduced-data-quantity image data, which contains the smaller quantity of data, is transmitted from the server system to the client computer. Since the quantity of data is small, the time needed to transmit the data to the client computer is shortened. When confirmation of an image cannot be performed based upon the image represented by the first item of reduced-data-quantity image data, a second item of reduced-data-quantity image data is transmitted to the client computer. Because the quantity of data in the image represented by the second item of reduced-data-quantity image data is greater than that of the first item of reduced-data-quantity image data, the image is easier to see. This makes it easier to confirm the image. In a case where an image having an even greater quantity of data is to be obtained, the original-image data is transmitted from the server system to the client computer. This makes it possible to print an image having a higher image quality.

Associating the original-image data and the reduced-data-quantity image data may be performed by storing the data in the same file or by assigning the same number to the data.

An arrangement may be adopted in which the server system generates image data having a predetermined specific data format that is independent of the data format of the original-image data.

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beforehand to each client computer, the memory storing temporarily the original-image data that has been received by the original-image data receiving unit. In this case, the original-image data transmitting unit of
5 the client computer sends the server system the original-image data having a quantity of data less than the quantity of data allocated beforehand.

Thus, the client computer sends the server system the original-image data the quantity of which conforms
10 to the data quantity that has been allocated to this client computer. This makes it possible to prevent a specific client computer from utilizing the entire memory of the server and assures that a large number of client computers will be capable of accessing the server
15 system. The above-mentioned memory of the server system need not be increased to cope with the number of client computers that access the server system.

It is preferred that the server system be provided with a storage unit for storing the original-image data
20 and the reduced-data-quantity image data of two stages.

An arrangement may be adopted in which the server system applies color adjustment processing to at least one item of image data among the original-image data and reduced-data-quantity image data of two stages.

25 The fact that color adjustment processing is executed makes it possible to obtain an image having good color reproducibility.

The client computer may further be provided with a

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5 server system specifying data which represents the image
data that has been specified by the data specifying
unit.

10 specifying data that has been transmitted from the
specifying-data transmitting unit. The color adjustment
unit (color adjusting means) applies the color
adjustment processing to image data, which has been
specified by the specifying data received by the
15 specifying-data receiving unit, among the original-image
data and reduced-data-quantity image data of two stages.

20 a prescribed format. In this case the server system is further provided with a format conversion unit (format conversion means) for converting the original-image data received by the original-image data receiving unit to a format that is capable of being displayed by the image display unit. The image data generating unit generates the reduced-data-quantity image data having a format that is capable of being displayed by the image display unit.

Thus the server system converts the format of the reduced-data-quantity image data to that of image capable of being displayed on the display unit of the client computer. Image data that has been transmitted
5 from the server system to the client computer is capable of displaying an image without being subjected to a format conversion in the client computer.

The client computer further includes a transmission requesting unit for sending the server system a request
10 to transmit at least one item of image data among the original-image data and reduced-data-quantity image data of two stages that has been stored in the storage unit.

In this case, the server system further includes a transmission-request receiving unit for receiving the
15 transmission request transmitted from the transmission requesting unit of the client computer; a first reception-privilege determination unit for determining whether the privilege to receive image data specified by the transmission request received by the transmission-
20 request receiving unit resides with the client computer that issued the transmission request; and a data transmitting unit, which is responsive to a determination by the first reception-privilege determination unit to the effect that the privilege
25 resides with the client computer, for reading the image data specified by the transmission request out of the memory unit and transmitting this image data to the client computer, and which is responsive to a

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determination by the first reception-privilege
determination unit to the effect that the privilege does
not reside with the client computer, for sending the
client computer data indicating that transmission is not
5 allowed.

Thus, the transmission request is transmitted from
the client computer to the server system. In a case
where reception privilege resides with the client
computer that transmitted the transmission request,
10 image data that conforms to the transmission request is
transmitted from the server system to the client
computer.

By granting the reception privilege to a specific
client computer, it is possible to allow the specific
15 client computer to receive the image data. The
reception privilege can be decided in dependence upon
the image data. For example, it is possible to
prescribe a client computer that is denied a privilege
to receive any image data, a client computer that is
20 allowed to receive only the first item of reduced-data-
quantity image data, a client computer that is allowed
to receive both of the two items of reduced-data-
quantity image data, and a client computer that is
allowed to receive all image data inclusive of the
25 original-image data.

The server system may further include an end-
message transmitting unit, which is responsive to
storage of the original-image data and the reduced-data-

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quantity image data of two stages in the storage unit,
for transmitting a message indicative of end of storage
to the client computer that transmitted the original-
image data.

5 By receiving the end message, the client computer is capable of ascertaining the fact that the original-image data has been stored in the storage unit of the server system.

The client computer may further include an image search-condition input unit for inputting image search conditions, and an image search-condition transmitting unit for sending the client computer the image search conditions that have been input from the image search-condition input unit.

15 In this case, it is preferred that the server
system include an image search-condition receiving unit
for receiving image search conditions that have been
transmitted from the image search-condition transmitting
unit; a search unit (search means) for searching, on the
20 basis of the image search conditions received by the
image search-condition receiving unit, at least one item
of data among the original-image data and reduced-data-
quantity image data of the two stages stored in the
storage unit; and a search-result information
25 transmitting unit for sending the client computer
information (the image represented by the image data,
conditions that match the image search conditions, an
indication of whether the image data of interest exists

Thus, by inputting image search conditions from the client computer, an image conforming to the input image search conditions is searched for in the server system. Information relating to the results of the search is transmitted from the server system to the client computer. By inputting the image search conditions at the client computer, information relating to the results of the search is obtained at the server system.

The server system may further include a second reception-privilege determination unit for determining whether the privilege to receive image data, which has been found as a result of the search conducted by the search unit, resides with the client computer. In this case, the search-result information transmitting unit, in response to a determination by the second reception-privilege determination unit to the effect that the privilege resides with the client computer, sends the client computer the image data found as a result of the search conducted by the search unit.

An image database registration system according to
25 the present invention comprises: an image file input
unit for inputting an image file which includes an
additional-information recording area in which
additional information has been recorded and an image-

5 recording area included in the image file input from the
image file input unit; an image data reading unit for
reading the image data that has been recorded in the
image-data recording area included in the image file
input from the image file input unit; and a storage
10 control unit for storing the additional information that
has been read by the additional-information reading unit
and the image data that has been read by the image data
reading unit in a storage unit in association with each
other.

15 The present invention provides also a method suited
to this system. Specifically, the method comprises the
steps of: inputting an image file which includes an
additional-information recording area in which
additional information has been recorded and an image-
20 data recording area in which image data representing an
image has been recorded; reading the additional
information that has been recorded in the additional-
information recording area included in the image file
that has been input; reading the image data that has
25 been recorded in the image-data recording area included
in the image file that has been input; and storing the
additional information that has been read and the image
data that has been read in a storage unit in association

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When additional information and image data have thus been stored in the storage unit in association with each other, image data can be searched as set forth below.

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The present invention provides also a recording medium storing a program for executing the above-described image database search system.

Additional information can be recorded in an image
20 file that includes an additional-information recording
area without using an input unit for inputting a
keyword. Image data can be retrieved using the
additional information as search information. Further,
there is no need for a special device for extracting
25 alphanumeric characters from an image, as in a case
where alphanumeric characters contained in an image are
used as a keyword.

Other features and advantages of the present

invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the figures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram showing an overview of an image data communication system;

Fig. 2 is a block diagram showing the electrical structures of a client computer and server system in a first embodiment of the present invention;

Fig. 3 illustrates an example of a user table;

Fig. 4 illustrates an example of a next-ID table;

Fig. 5 illustrates a group-ID table;

Fig. 6 illustrates an example of a data table;

Fig. 7 illustrates an example of an access table;

Fig. 8 illustrates an example of a binary table;

Fig. 9 illustrates the organization of folders stored in an image file unit;

Fig. 10 shows flowcharts illustrating processing procedures of the client computer and server system;

Figs. 11 to 13 illustrate examples of windows displayed on a display unit of the client computer;

Figs. 14 and 15 are flowcharts illustrating processing procedures of the client computer and server system;

Fig. 16 illustrates an example of a window displayed on the display unit of the client computer;

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Figs. 17 to 20 are flowcharts illustrating processing procedures of the client computer and server system;

Figs. 21 to 28 illustrate examples of windows
5 displayed on the display unit of the client computer;

Fig. 29 is a block diagram illustrating the electrical structure of a server system capable of communicating with the client computer in a second embodiment of the present invention;

10 Fig. 30 illustrates an example of a window displayed on the display unit of the client computer;

Fig. 31 illustrates the organization of folders;

Fig. 32 is a flowchart illustrating the procedure of processing executed by the client computer when an
15 image file is registered;

Fig. 33 is a flowchart illustrating the procedure of processing executed by the server system when an image file is registered;

Fig. 34 is a flowchart illustrating the procedure
20 of processing executed by an image receiving unit;

Fig. 35 is a flowchart illustrating the procedure of processing executed by an image-file registration unit;

Fig. 36 illustrates an example of a window
25 displayed on the display unit of the client computer;

Fig. 37 illustrates the overall configuration of a system according to a third embodiment of the present invention;

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5 Fig. 39 illustrates the structure of an image file;

Fig. 41 illustrates an image table;

10 Fig. 43 is a flowchart illustrating the procedure
of processing executed by the digital camera;

Fig. 45 is a flowchart illustrating the procedure

Fig. 46 is a flowchart illustrating the procedure of processing executed by the client computer;

20 Fig. 48 illustrates an example of a window
displayed on the display unit of the client computer.

Preferred embodiments of the present invention will now be described in detail with reference to the
25 drawings.

Fig. 1 shows an overview of an image data communication system according to a first embodiment of

the present invention.

The image data communication system comprises client computers 1 and a server system 10. The client computers 1 and server system 10 are capable of communicating data with each other via a network such as the Internet.

In this image data communication system, original-image files (data) representing original images are transmitted from the client computers 1 to the server system 10.

The server system 10, besides storing a received original-image file temporarily, subjects an original-image file to a format conversion and generates a large-image file representing a large image. The server system 10 further generates a medium-image file, which is a file in which the quantity of data is less than that in the large-image file, and a thumbnail-image file in which the quantity of data is less than that in the medium-image file. The original-image file, large-image file, medium-image file and thumbnail-image file are included in one folder and stored in an image file unit 17, described later. The details of the image data communication system will become clear from the description that follows.

Fig. 2 is a block diagram showing the electrical structure of each client computer 1 and the electrical structure of the server system 10. Though each of the circuits shown in Fig. 2 is illustrated as being

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5 The client computer 1 includes a computer 2, which
in turn includes a CPU, a memory, a CD-ROM (compact disk
read-only memory) drive and a display unit, etc. An
operating program is stored on a CD-ROM 6 so that the
client computer 1 will execute processing in the manner
10 described below. When the CD-ROM 6 is inserted into the
client computer 1, the operating program is read by the
computer 2.

The server system 10 includes a Web server 11,
25 which in turn includes a CPU, a memory, a CD-ROM drive
and a display unit, etc. An operating program is stored
on a CD-ROM 18 so that the server system 10 will execute
processing in the manner described below. When the

The server system 10 further includes an HTML file unit 12 in which data for displaying an image page based upon HTML is stored, a database 15 for storing various data, a database controller 14 for causing various data to be stored in the database 15, an image file unit 17 for storing image files, attachment files and the like transmitted from the client computer 1, an image file controller 16 for controlling the storage of image files, attachment files and the like in the image file unit 17, and an image file processing unit 13 for overall control of the operation of the server system 10.

Fig. 3 is a user table. The user table stores information relating to the user who utilizes the image data communication system. The information in the user table is stored beforehand in the database 15 by the administrator of the server system 10.

Specifically, the table stores a user ID (User ID);
a group number (Group ID) (the user constitutes a group
25 composed of a plurality of users, and the group number
is used to specify this group); a user name (User Name);
a password (Password) for verifying that the user
possesses the privilege to utilize the image data

communication system; an indication (Entry OK) as to whether or not the user possesses the privilege to access a registration page displayed on the display unit of the client computer 1 when an original-image file is registered with the server system 10; an indication (Search OK) as to whether the user possesses the privilege to access a search page displayed on the display unit of the client computer 1 when image files that have been registered with the server system 10 are searched; an indication (Result OK) as to whether the user possesses the privilege to access a list-display page of search results; an indication (Detail OK) as to whether the user possesses the privilege to access a page indicating information more detailed than information found as the result of a search; and data representing whether the user possesses the privilege (binary-access privilege "Binary OK") to access an original image and a file attached to an original-image file.

Fig. 4 is a next-ID table. The next-ID table stores data relating to record numbers used to specify folders containing original-image files, large-image files, medium-image files and thumbnail-image files that have been stored in the image file unit 17 of the server system 10.

Specifically, the current record number (Current ID), which specifies the folder that was stored in the image file unit 17 last, and the next record number

Fig. 5 is a group-ID table, which stores the group number (Group ID) and the group name (Group Name). Data that is stored in the group-ID table also is registered beforehand by the administrator of the server system 10.

10 Stored in the data table are a record number, the ID (Owner ID) of the user (owner) that registered an image, the number (Num of Binary) of attachment files, and keywords (Image Info) (four keywords are indicated in Fig. 6).

Besides the record number, group numbers (Access ID0 - Access ID4) indicating a group number of privilege 0 to a group number of privilege 4 have been stored in the access table. A group number of privilege 0 indicates the number of a group that is denied access to all images, namely thumbnail, medium, large and original images. A group number of privilege 1 indicates the number of a group that is allowed to access a thumbnail image but is denied access to medium, large and original images. A group number of privilege 2 indicates the number of a group that is allowed to access thumbnail

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in each of the image folders of the second layer of image folders. A fourth layer of image folders of folder numbers "00" to "FF" is stored in each of the image folders of folder numbers "00" to "FF" of the

5 third layer.

A thumbnail-image file, medium-image file, large-image file, original-image file and attachment files are stored in the image folders of the fourth layer. A binary file number is assigned to the original-image file and to each attachment file.

These image folders are generated anew when thumbnail-image files, medium-image files and large-image files are generated and the generated thumbnail-image files, medium-image files and large-image files, along with the original-image files and attachment files, are stored in the image file unit 17.

An assemblage of the folder numbers of the first to fourth layers corresponds to a record number. The record number serves as a path to an image folder in which a thumbnail-image file, medium-image file, large-image file, original-image file and attachment files have been stored. For example, if the record number is "0000F823", an image folder in which a thumbnail-image file, medium-image file, large-image file, original-image file and attachment files have been stored is specified by the path "%ROOT%\00\00\F8\23".

Fig. 10 shows flowcharts illustrating processing procedures of the client computer 1 and server system

5 unit of the computer 2 of client computer 1.

15 destination displayed in the field A1 is not erroneous,
the user of the client computer 1 clicks an "OK" area
A2.

20 attempting to access.

25 server system 10 to the image information storage unit 4

The log-in page window W2 includes a user-name field A3, a password field A4 and an "OK" area A2. Using the keyboard of the computer 2, the user of the client computer 1 enters his or her own name, whereby the entered name is displayed in the user-name field A3. Further, using the keyboard of the computer 2, the user enters a password, in response to which asterisks are displayed in the field A4 (step 22). The password is for verifying whether the user possesses the privilege to utilize the image data communication system. A user having the privilege knows the password in advance. When the entry of the user name and password has been completed, the user of the client computer 1 clicks the "OK" area A2.

The items of data indicating the user ID, the user

The database controller 14 is controlled by the image file processing unit 13. The database 15 is searched by the database controller 14 and a user table which corresponds to the user who requested the main-menu page is found among the user tables (see Fig. 3) that have been stored in the database 15.

Reference is had to the found user table to verify the user name, the user ID and password (step 31). If the result of verification is that the user has the privilege to utilize the image data communication system ("OK" at step 32), then, under the control of the image file processing unit 13, the main-menu page data is read out of the HTML file unit 12 and is then transmitted to the client computer 1 by the Web server 11 (step 34). If the user has the utilization privilege, the group number indicating the group to which the user belongs is also read out of the user table and then transmitted to the client computer 1. If the result of verification is that the user does not have the privilege to utilize the image data communication system ("NG" at step 32), then, under the control of the image file processing unit 13, error-page data is read out of the HTML file unit 12 and is then transmitted to the client computer 1 by the Web server 11 (step 33).

When the main-menu page data is received, a window

W3 indicating the main menu is displayed on the display unit of the computer 2, as shown in Fig. 13, at the client computer 1 (step 25). The main-menu window W3 includes a registration area A5, a search area A6 and a log-off area A7. Clicking the registration area A5 results in a transition to image registration processing (described later), and clicking the area A6 results in a transition to image search processing (described later). The client computer 1 logs off in response to clicking of the log-off area A7.

When the error-page data is received, a window indicating an error is displayed on the display unit of the computer 2 at the client computer 1. By observing the error window, the user of the client computer 1 ascertains that an error has occurred such as entry of an erroneous user name or password. If necessary, the user tries accessing the server system 10 again.

Figs. 14 and 15 are flowcharts illustrating processing procedures of the client computer 1 and server system 10. These flowcharts show the procedure of processing for registering image information. Fig. 16 illustrates an example of a window displayed on the display unit of the client computer 1.

Processing for registering image information is started by clicking the registration area A5 in the main-menu window W3 shown in Fig. 13.

When the registration area A5 is clicked by the user of the client computer 1, the user ID and data

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5 Image selection area A9: This is an area clicked
by the user of the client computer 1 when an original-
image file to be transmitted from the client computer 1
to the server system 10 is selected. A new window for
entering a file name is displayed by clicking the area
10 A9. By entering a file name in this new window, the
original-image file to be transmitted to the server
system 10 is selected.

Attachment file add-on area A11: This is an area
clicked by the user of the client computer 1 when an
attachment file is to be added on. A new window for
20 entering an attachment file name is displayed by
clicking the area A11. By entering an attachment file
name in this new window, the attachment file to be
transmitted is selected. The attachment file that has
been selected is displayed in the attachment file name
25 display area A10.

Keyword input area A12: This is an area for displaying keywords (one type of image search condition) used when an original-image file to be transmitted is

5 more keywords can be entered may be adopted.

Access privilege input fields A13 - A16: These are areas for entering the names of groups that are capable of accessing images registered with the server system. According to this embodiment, access privileges of the five levels of 0 to 4 are available. Access privilege 0 denies access to all images, namely thumbnail, medium, large and original images, that have been registered with the server system 10. A group name given access privilege 0 is written in the field A13. Access privilege 1 allows access to a thumbnail image but denies access to medium, large and original images. A group name given access privilege 1 is written in the field A14. Access privilege 2 allows access to thumbnail and medium images but denies access to large and original images. A group name given access privilege 2 is written in the field A15. Access privilege 3 allows access to thumbnail, medium and large images but denies access to an original image. A group name given access privilege 3 is written in the field A16. Access privilege 4 allows access to all images, namely thumbnail, medium, large and original images. A group name given access privilege 4 is written in the field A17.

original-image file, the original-image file is read out of the computer 1 and is then transmitted to the server system 10 by the image information controller 5 (step 46).

5 When the original-image file is received by the server system 10, the file is stored in the temporary storage folder of the image file unit 17 by the image file controller 16 (step 56). The image file controller 16 provides the client computer 1 with notification of
10 completion of reception. The image file processing unit 13 provides the client computer 1 with a request for transmission of an attachment file.

 The attachment file is read out of the computer 2 and stored temporarily by the image information
15 controller 5. The attachment file stored is read out and transmitted from the client computer 1 to the server system 10 (step 47).

 After the attachment file transmitted from the client computer 1 is stored temporarily in the image
20 file controller 16, it is stored in the temporary storage folder of the image file unit 17 (step 57). When the attachment file is stored in the temporary storage folder, the image file controller 16 sends the client computer 1 notification of completion.

25 The next-ID table that has been stored in the database 15 is then searched by the database controller 14 and the next record number is read out. The current record number is updated to the next record number (step

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A subsampling rate is decided in the image file controller 16 based upon the large-image file that has been generated. Subsampling processing is executed by

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system 10 without failure. Since an original-image file, large-image file, medium-image file and thumbnail-image file have already been stored in the server system 10, the user of the client computer 1 that registered the image file is capable of accessing the desired image file by accessing the server system 10 using the client computer 1. Furthermore, a user other than the user of the client computer 1 that registered the image file can, in dependence upon the access privilege of this user, access the original-image file, large-image file, medium-image file or thumbnail-image file.

The original-image file itself is stored in the Web server 11. This image file represents the image having the highest image quality. Printing of an image having a very high image quality is possible at the server system 10.

If error-page data is received at the client computer 1, an error page is displayed on the display unit of the computer 2 (step 42). If registration-failure page data is received by the client computer 1, a registration-failure page is displayed on the display unit of the computer 2 (step 48). In either case, the user of the client computer 1 becomes aware of the fact that an image file failed to be registered with the server system 10. If necessary, the user of the client computer 1 executes processing again to register the image information.

Figs. 17 to 20 are flowcharts illustrating

processing for searching image files, and Figs. 21 to 28 illustrate examples of windows displayed on the display unit of the computer 2 of client computer 1.

When the main-menu page (see Fig. 13) is being
5 displayed on the display unit of the computer 2 of the client computer 1, the search area A6 is clicked by the user of the client computer 1, whereby a transition is made to image file search processing.

When the search area A6 on the main-menu page is
10 clicked, the user ID and data indicating a request for a file search page are transmitted from the image information storage unit 4 to the server system 10 (step 71).

The user ID and the data indicating the request for
15 the file search page are input to the image file processing unit 13 of the server system 10, whereupon the database controller 14 is controlled to search the user tables, which have been stored in the database 15, for a user table having the user ID transmitted from the
20 client computer 1. If the corresponding user table is found, the absence or presence of the privilege to access the search page stored in this user table is checked to confirm whether access to the search page is allowed or not (step 111).

25 If the client computer 1 has the privilege to access the search page ("OK" at step 112), search-page data is read out of the HTML file unit 12 and the data is then transmitted to the client computer 1 by the Web

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server 11 (step 114). If the client computer 1 does not possess the privilege to access the search page ("NG" at step 112), error-page data is read out of the HTML file unit 12 and is then transmitted to the client computer 1 by the Web server 11 (step 113).

When the error-page data is received, the HTML engine 3 of the client computer 1 displays an error page on the display unit of the computer 2 (step 72). By observing the error page, the user of the client computer 1 ascertains that the client computer 1 does not possess the search privilege.

When the search-page data is received, the HTML engine 3 of the client computer 1 displays a search page of the kind shown in Fig. 21 on the display unit of the computer 2 (step 73). The search page includes the following areas and fields:

Keyword display fields A21 - A24: These are fields for displaying keywords entered by the user. Using the keyboard of the computer 2, the user enters keywords which the user believes are possessed by the image to be found.

First search condition display areas A25 - A28: These are areas for specifying whether an image file that contains an entered keyword is to be searched or whether an image file that excludes an entered keyword is to be searched, and for displaying the search conditions that have been specified. The first search condition display areas A25 - A28 are provided in

association with the keyword display fields A21 - A24,
and the search conditions also are input in association
with the respective keywords.

Second search condition display areas A29 - A32:

5 These are areas which, if a plurality of keywords have been entered, specify whether the plurality of keywords are to be searched under an AND condition or under an OR condition and display the search conditions that have been specified.

10 Clear area A33: This is an area clicked by the
user of the client computer 1 when all entered keywords
and search conditions are to be cleared.

Search start area A34: This is an area clicked by
the user of the client computer 1 when registration of
15 image information with the server system 10 is to start.

When the search page is displayed on the display unit of the computer 2, keywords and search conditions are entered in the respective areas (step 74). The entered keywords and search conditions are stored temporarily in the image information storage unit 4. Data representing the stored keywords and search conditions are read out of the image information storage unit 4 and transmitted to the server system 10 (step 75).

25 The data representing the keywords and search
conditions is input to the image file processing unit
13, whereupon a user table having the user ID already
transmitted from the client computer 1 is searched for

5 a list of search results (step 116).

10 is transmitted from the HTML file unit 12 to the client
computer 1 (step 113). If the client computer 1 possess
the access privilege ("OK" at step 117), the data table
having the given keyword is found from the database 15
and the image file processing unit 13 generates the page
15 displaying the list of search results (step 118).

20 The data representing the record number is stored in the
image information storage unit 4.

25 result, a window W6 of the search-result-list display
page shown in Fig. 22 is displayed on the display unit
of the computer 2 (step 76). When the error-page data
has been received, an error page is displayed on the

display unit of the computer 2 (step 77). The window W6 of the search-result-list display page includes areas A35 to A37 in which thumbnail images are displayed and an area A38 in which keywords possessed by thumbnail
5 images are displayed in association with the thumbnail images. As will be described later, an "x" mark is displayed in a thumbnail-image display area with regard to a thumbnail image for which there is no access privilege (see area A37 in Fig. 23). Since thumbnail
10 images (as well as medium and large images) have been subjected to a format conversion so as to be displayable on the display unit of the computer 2 of the client computer 1, thumbnail-image files need not be subjected to a format conversion by the client computer 1 in order
15 to be displayed on its display unit.

When the window W6 (see Fig. 22) of the search-result-list display page is displayed the first time, nothing is displayed in the areas A35 to A37. By observing the keywords displayed in the area A38, the
20 user of the client computer 1 judges whether the thumbnail images specified by these keywords are necessary. If a thumbnail image is necessary, the desired area from among the areas A35 to A37 that corresponds to the keywords is clicked. When this is
25 done, a request to transmit the corresponding thumbnail image and data indicating the record number of this thumbnail image are transmitted from the client computer 1 to the server system 10 (step 79).

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The access table (Fig. 7) in which the transmitted record number has been stored is found from the database by the database controller 14. A user table (Fig. 3) containing the user ID already transmitted from the client computer 1 is found and the group number is read out. On the basis of the group number that has been read out, it is determined whether the group has the privilege to access the thumbnail-image file for which transmission has been requested (step 120). If the group number possesses any one of the privileges 1 to 4, access to the thumbnail image is allowed. If the group number possesses privilege 0, access to the thumbnail image is denied.

If the client computer 1 has access privilege ("OK" at step 121), the corresponding image folder is retrieved based upon the record number (step 122) and the thumbnail-image file is read out. The thumbnail-image file that has been read out is transmitted from the Web server 11 to the client computer 1 (step 123). If the client computer 1 does not have access privilege ("NG" at step 121), "x"-mark data is transmitted to the client computer 1 (step 124). As a result, thumbnail images (A35 and A36 in Fig. 23) for which there is access privilege and an "x" mark (area A37 in Fig. 23) indicating that there is no access privilege are displayed in the window W6 of the search-result-list display page being displayed on the display unit of the computer 2.

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Attachment-file display area A44: When an

Original-image download area A45: This is an area
5 clicked by the user of the client computer 1 when an
original-image file is to be downloaded.

10 When a medium-image file is downloaded, the user of
the client computer 1 clicks the medium-image display
area A41 (step 87), whereupon data representing a
request for the medium image is transmitted from the
client computer 1 to the server system 10 (step 88).

If the client computer 1 has access privilege ("OK" at step 130), reference is had to the record number, the image folder is found from the image file unit 17 and

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The database 15 in the server system 10 is searched and the access table having the transmitted record number is found. Whether or not access to a large image is allowed is verified based upon the access table (step 5 133). If the record number of the client computer 1 has privilege 3 or 4, the client computer 1 is allowed to access the large image. If the record number of the client computer 1 has privilege 0, 1 or 2, the client computer 1 is denied access to the large image.

10 If access to the large image is allowed ("OK" at step 134), the large-image file contained in the image folder identified by the record number is read out and the file is then transmitted to the client computer 1 by the Web server 11 (step 136). If access to the large 15 image has been denied ("NG" at step 134), data indicative of the "x" mark is transmitted to the client computer 1 (step 135).

If the large-image file is transmitted to the client computer 1, a large image of the kind shown in 20 Fig. 28 is displayed on the display unit of the computer 2 (step 94). Since the user of the client computer 1 can thus obtain a large image having a high resolution, a high-quality image can be printed by the user. If data indicative of the "x" mark is transmitted to the 25 client computer 1, a window showing the "x" mark of the kind illustrated in Fig. 27 is displayed on the display unit of the computer 2 (step 95). The user of the client computer 1 thus ascertains that he or she does

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If the original-image download area A45 or attachment-file download area A46 of the detailed-information display page is clicked, this signifies a request for an original-image file or attachment file (step 96). A window for entering the user name and group name is again displayed on the display unit of the computer 2. The user name and group number are entered by the user (step 98). The user ID is found from the user name and the data representing the user ID and group name is sent to the server system 10 (step 99).

Whether or not access to an original image or attachment file is allowed is verified by the server system 10 (step 137). More specifically, when the user ID and group name are received by the server system 10, the user table identified by this user ID is found. Reference is had to the binary-access privilege of the user table to check whether binary-access privilege has been granted or not. If binary-access privilege has been granted, the downloading of the attachment file is allowed. If there is a request to download an original-image file, reference is had also to the access table to check the access privilege of the group to which the client computer 1 belongs. If the access privilege of the group to which the client computer 1 belongs is 4, then access to the original-image file is granted. If the access privilege is not 4, then access to the original-image file is denied.

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5 (2) Second embodiment

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The quantities of data capable of being stored in the primary memories contained in respective image receiving units 301, 302 and 303 are stipulated in advance in correspondence with the client computers 1A, 1B and 1C, respectively. Consequently, the quantity of data that can be transmitted from each of the client computers 1A, 1B and 1C to the server system 10A at one time is decided in advance. The client computers 1A, 1B and 1C thus transmit data to the server system 10A in accordance with the data quantity that has been decided for each client computer.

25 The server system 10A includes an image-file
registration unit 304. The latter includes a format
converter 306 for converting the data format of image
data, a color adjustment unit 307 for applying a color

adjustment to an image represented by image data, and a FIFO memory 305 for temporarily storing image data.

Fig. 30 shows an example of a window displayed on a display unit included in each client computer. Fig. 30 shows an image-information input window Wi4 and corresponds to the window illustrated in Fig. 16. Fields and areas in Fig. 30 identical with those shown in Fig. 16 are designated by like reference characters and need not be described again.

The image-information input window Wi4 shown in Fig. 30 includes a format-conversion designating area A18. The latter is an area which the user of the client computer clicks using a mouse or the like when original-image data is to be converted to a predetermined specific format [NSK-TIFF (Nihon Shimbun Kyokai - Tag Image File Format) in this example] in the server system 10A. It goes without saying that the format conversion is carried out by the format converter 306.

The image-information input window Wi4 includes a field A19 for setting the color adjustment level. The user of the client computer enters the color adjustment level in field A19 using a keyboard, for example. The color adjustment levels are from 1 to 7. Level 1 specifies color adjustment of a thumbnail image, level 2 color adjustment of a medium image, level 3 color adjustment of a thumbnail image and intermediate image, level 4 color adjustment of a large image, level 5 color adjustment of an thumbnail image and large image, level

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Fig. 31 illustrates the organization of a folder
5 stored in the image file unit 17. This corresponds to
Fig. 9.

Figs. 32 and 33 are flowcharts showing the procedure of processing for registering image information. The processing is split between one of the client computers 1A, 1B and 1C and the server system 10A. These flowcharts correspond to the flowcharts shown in Figs. 14 and 15. Processing steps in Figs. 32 and 33 identical with those shown in Figs. 14 and 15 are designated by like step numbers and need not be

described again.

As mentioned above, the image-information input window Wi4 shown in Fig. 30 is displayed on the display unit of the client computer (step 41) and various items of image information are entered. (It is assumed here that the format conversion area A18 has been checked and that the field for the color adjustment level has been set to level 7.)

Binary-file transmission limiting size data which indicates the quantity of data that can be transmitted to the server system 10A is transmitted from the server system 10 to the client computer that is accessing the server system 10A (step 211). Further, the user ID of the client computer for which the record number has been updated and which is accessing the server system 10A is acquired in the Web server 11 of the server system 10A (step 212). A request for image transmission is received from the client computer (step 213).

When the request for image transmission is received, the corresponding image receiving unit in the image receiver group 300 is provided with the record number and user ID from the Web server 11 and a reception request is issued to the image receiving unit (step 214). When the reception request is accepted from the Web server 11, the image receiving unit executes processing to receive an original-image file in an amount equivalent to the limited size. The details of this reception processing will be described later. When

The binary-file transmission limiting size data
5 that has been transmitted from the server system 10A is
received by the client computer (step 200), whereupon
the data quantity of the binary file capable of being
transmitted from the client computer to the server
system 10A is displayed on the display unit of the
10 client computer. By observing the data quantity
displayed on the display unit, the user of the client
computer can tell the quantity of data that can be
transmitted to the server system 10A.

When image information enters the client computer 1
15 (step 44) and database registration information is
transmitted to the server system 10A (step 45), the
original-image data in the amount equivalent to the size
limited on the side of the server system is transmitted
from the client computer to the server system 10A (step
20 46A). When original-image data of an amount in excess
of the limited size is transmitted from the client
computer to the server system 10A, the original-image
data to be transmitted is split into portions the size
of each of which is less than the limited size. The
25 original-image data thus split is transmitted to the
server system 10A over several cycles and is
reconstructed into the original-image data in the server
system 10A.

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this is done, the image-file registration unit 304 executes image-file registration processing. The details of image-file registration processing in the image-file registration unit 304 will be described later. When image-file registration processing by the image-file registration unit 304 ends, the image-file registration unit 304 provides the Web server 11 with the record number and user ID (step 217). The database registration information is thenceforth registered in the database 15 in the manner described above (step 218).

Fig. 34 is a flowchart of processing executed by the image receiving unit to receive an original-image file and an attachment file.

As mentioned above, the image receiving unit is provided with a record number and user ID by the Web server 11 (step 221). The client computer transmits an original-image file having the data quantity of the limited size for this client computer, and the original-image file is received by the image receiving unit (step 222). The received original-image file of the limited size is stored temporarily in the primary memory contained in the image receiving unit. The temporarily stored original-image file is read out of the image receiving unit and stored by the image-file registration unit 304 in the temporary storage folder of the image file unit 17 (step 223). Since the primary memory of the image receiving unit is emptied when this done ("NO"

at step 224), a request for transmission of the next original-image file is transmitted to the client computer (step 225). Upon receiving the transmission request, the client computer responds by sending the server system 10A an original-image file having the data quantity of the limited size.

An attachment file also is transmitted from the client computer to the server system in data quantities of the limited size in a manner similar to that of the original-image file. The attachment file of the limited size is received by the image receiving unit and is stored temporarily in the primary memory (step 226). The attachment file stored temporarily in the image receiving unit is read out and is stored temporarily by the image-file registration unit 304 in the temporary storage folder of the image file unit (step 227). If there is a next attachment file ("NO" at step 228), a transmission request for this file is sent from the image receiving unit to the client computer (step 229).

20 If all original-image files and attachment files to
be transmitted from the client computer are received by
the image receiving unit and these are stored in the
temporary storage folder of the image file unit 17, the
Web server is provided with the record number and user
25 ID by the image receiving unit (step 230).

Fig. 35 is a flowchart illustrating the procedure of image-file registration processing executed by the image-file registration unit 304.

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server system 10A in accordance with the client computer

A window W9 of the kind shown in Fig. 36 is displayed on the display unit of the client computer to make it possible to download such a specific image file to the client computer. By clicking the original-image download area A45 when the window illustrated in Figs. 24 to 26 is being displayed, the user causes the window W9 to be displayed on the display unit.

One or a plurality of the areas A61, A62 and A63 can be checked. The image file designated by the checked area would be read out of the image file unit 17

of server system 10A and transmitted to the client computer.

Since color adjustment processing is carried out, an image having excellent color reproducibility can be
5 obtained.

(3) Third embodiments

Figs. 37 to 48 illustrate a third embodiment of the present invention.

Fig. 37 illustrates the overall configuration of an
10 image data communication system according to the third embodiment.

An image transmitting unit 320 and an image
database server 330 are connected via a network such as
the Internet so as to be capable of communicating with
15 each other. As will be described later, an image file
obtained by image sensing using a digital camera 310 is
applied to the image transmitting unit 320. The image
file is transmitted from the image transmitting unit 320
to the image database server 330.

20 Client computers 1 capable of communicating with
the image database server 330 also is connected to the
network.

Fig. 38 is a block diagram showing the electrical
structures of the digital camera 310, image transmitting
25 unit 320, image database server 330 and client computer
1. Components in Fig. 38 that are identical with those
of the client computer and server system of the first
embodiment are designated by like reference characters

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image file generated by the digital camera.

The image file includes an image-format header for managing the overall image file, an additional-information area for recording additional information, and an image-data recording area for recording image
5 data.

Recorded in the additional-information recording area are bar-code data representing a bar code that has been read by the bar code reader 302, data representing date of photography and position information
10 representing the location of photography sensed by the GPS receiving unit 301.

The image-format header contains the size of the image data that has been recorded in the image-data recording area, the number of horizontal-direction
15 pixels of the image represented by the image data, the number of vertical-direction pixels of the image represented by the image data, the offset (path) to the image data, a position-information flag indicating the absence or presence of position information (GPS
20 information), a bar-code flag indicating the absence or presence of bar-code data, an offset (path) to the position information, the data size of position information, an offset to the bar-code data, the size of the bar-code data, an offset to the date of photography
25 and the size of the date-of-photography data.

Figs. 40 to 42 illustrate an example of the structure of the database 15 contained in the image database server 330.

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An image index is attached to each item of image data and is used to identify the image data. The index management database has an area for storing the current image index and an area for storing the next image index. The index management database makes it possible to prevent the assignment of redundant image indices to image data.

Figs. 43 to 45 are flowcharts illustrating processing procedures for when image data is recorded in the image database server 330.

Fig. 43 is a flowchart illustrating the procedure of processing executed by the digital camera 310.

An image of interest (generally a product to which a bar-code number has been assigned) is sensed by the image input unit 312 to obtain image data representing the image of interest (step 331). The image data representing the image of interest is input to the processing unit 313, where the image data is stored temporarily.

20 A bar code corresponding to the image of interest
is read by the bar code reader 302 (step 332). Data
representing the bar code is input to the digital camera
310 via the interface 311 and the data is applied to the
processing unit 313. The date and time of photography
25 is read from the timer 313A included in the processing
unit 313 (step 333).

The digital camera 310 and GPS receiving unit 301 are connected. Position information obtained by the GPS

receiving unit 301 is read by the processing unit 313 of the digital camera 310 via the interface 311 (step 334).

The image data is recorded in the image-data recording area of the image file in the processing unit 313, and the photography date-and-time data and position information are stored in the additional-information recording area of the image file (step 335). The image file is recorded by the image recording unit 314 on the recording medium 305 that has been inserted into the digital camera 310 (step 336).

Fig. 44 illustrates the procedure of processing executed by the image transmitting unit 320.

The recording medium 305 on which an image file has been recorded in accordance with the processing shown in Fig. 43 is inserted into the image transmitting unit (step 341). The image file is read out of the recording medium 305 and stored temporarily in the file transmitter 322.

The image database server 330 that is to be sent
20 the image file is designated by the operator of the
image transmitting unit 320 using the file transmitter
322 and this designation is applied (step 342).

When a connection is set up between the image database server 330 that is to be sent the image file and the image transmitting unit 320 (step 343), the image file is transmitted to the image database server 330 by the file transmitter 322 (step 344).

Fig. 45 illustrates the procedure of processing

The image file that has been transmitted from the image transmitting unit 320 is received by the image receiver unit 300 of the image database server 330 (step 5 351). The image file received by the image receiver unit 300 is applied to the image file processing unit 13, which proceeds to interpret the format of the received image file (step 352). When the format is interpreted, the bar-code data that has been recorded in 10 the additional-information recording area of the image file is read (step 353). Further, the photography date-and-time data and position information are read from the additional-information recording area (steps 354, 355).

The bar-code number, date and time of photography and position information are recorded in the image table in accordance with the image index that has been read (step 357). The image data that has been recorded in the image-data recording area of the image file as image data identified by the read image index is recorded in the image file unit 17 (step 348).

Figs. 46 and 47 are flowcharts illustrating the procedure of processing for conducting a search of image

data. Fig. 46 illustrates the procedure of processing executed by the client computer 1, and Fig. 47 illustrates the procedure of processing executed by the image database server 330.

5 A bar code is read by the bar code reader 9 connected to the client computer 1 (step 361). A search command is specified by the user of the client computer 1, and the bar-code number and search command are transmitted to the image database server 330 (step 363).

10 The bar-code number is received by the Web server 11 of image database server 330 (step 371). When the bar-code number is received, it is applied to the database controller 14. The latter refers to the image table, which has been stored in the database 15, and
15 searches for the image index that corresponds to this bar-code number (step 373). If the image index is found, it is applied to the image file controller 16. The image data identified by this image index is retrieved from the image file unit 17 by the image file
20 controller 16 (step 374).

 Further, the image table is referred to based upon the image index to retrieve the date and time of photography and the position information (step 375). It is of course possible to adopt an arrangement in which
25 the date and time of photography and the position information are read out based upon the bar-code number.

 Further, reference is had to the product information table to retrieve from the bar-code number

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the product name and product information specified by the bar-code number (step 376).

If the image data, date and time of photography, position information, product name and product
5 information corresponding to the bar-code number are found by the image database server 330, these are transmitted to the client computer 1 (step 377).

The data representing the image data, date and time of photography, position information, product name and
10 product information is received by the client computer 1 (step 364), whereupon a window W10 of search results of the kind shown in Fig. 48 is displayed (step 365).

The search-result window W10 includes areas A71 and A72. An image represented by image data that has been
15 transmitted from the image database server 330 is displayed in the area A71, and the product name of the image being displayed in the area A71, the date and time of photography of this image and the product information are displayed in the area A72.

20 By reading the bar code, the user of the client computer 1 is not only capable of obtaining product information represented by the bar code but can also view the image of the product, the date and time of photography, etc.

25 As many apparently widely different embodiments of the present invention can be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific

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WHAT IS CLAIMED IS:

1. An image data communication system in which a plurality of client computers and a server system are capable of communicating with each other via a network,
5 wherein one of said client computers includes:
 - an original-image data specifying unit for specifying original-image data that is to be transmitted to said server system; and
 - an original-image data transmitting unit for
10 transmitting the original-image data, which has been specified by said original-image data specifying unit, to said server system; and
 - said server system includes:
 - an original-image data receiving unit for receiving
15 the original-image data transmitted from said original-image data transmitting unit;
 - an image data generating unit, which responds to receipt of the original-image data by said original-image data receiving unit, for generating reduced-data-
20 quantity image data of two stages representing at least two images possessing data quantities of at least two stages in each of which the quantity of data is less than that of the original-image data; and
 - a unit for associating the original-image data,
25 which has been received by said original-image data receiving unit, and the reduced-data-quantity image data that has been generated by said image data generating unit.

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5 of the data format of the original-image data.

10 4. The system according to claim 1, wherein said server
system further includes a memory in which the quantity
of original-image data that can be stored is allocated
beforehand to each client computer, said memory storing
temporarily the original-image data that has been
15 received by said original-image data receiving unit;

20 5. The system according to claim 4, wherein said server system further includes a data-quantity information transmitting unit for sending said client computer information representing a pre-allocated data quantity capable of being stored in said memory;

said original-image data transmitting unit of said client computer sending said server system the original-image data having a data quantity less than the quantity of data allocated beforehand based upon said

information, which represents the data quantity,
transmitted from said data-quantity information
transmitting unit of said server system.

6. The system according to claim 1, wherein said server
5 system further includes a storage unit for storing the
original-image data and the reduced-data-quantity image
data of two stages.

7. The system according to claim 1, wherein said server
10 system further includes a color adjustment unit for
applying color adjustment processing to at least one
item of image data among the original-image data and
reduced-data-quantity image data of two stages.

8. The system according to claim 1, wherein said client
computer further includes:

15 a data specifying unit for specifying image data
that is to undergo color adjustment among the original-
image data and reduced-data-quantity image data of two
stages; and

a specifying-data transmitting unit for sending
20 said server system specifying data which represents the
image data that has been specified by said data
specifying unit; and

said server system further includes a specifying-
data receiving unit for receiving the specifying data
25 that has been transmitted from said specifying-data
transmitting unit of said client computer;

said color adjustment unit applying color
adjustment processing to image data, which has been

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specified by said specifying data received by said specifying-data receiving unit, among the original-image data and reduced-data-quantity image data of two stages.

9. The system according to claim 6, wherein said client
5 computer further includes a transmission requesting unit for sending said server system a request to transmit at least one item of image data among the original-image data and reduced-data-quantity image data of two stages that has been stored in said storage unit; and

10 said server system further includes:

a transmission-request receiving unit for receiving the transmission request transmitted from said transmission requesting unit of said client computer;

a first reception-privilege determination unit for
15 determining whether the privilege to receive image data specified by the transmission request received by said transmission-request receiving unit resides with the client computer that issued the transmission request; and

20 a data transmitting unit, which is responsive to a determination by said first reception-privilege determination unit to the effect that the privilege resides with said client computer, for reading the image data specified by the transmission request out of said
25 memory unit and transmitting this image data to said client computer, and which is responsive to a determination by said first reception-privilege determination unit to the effect that the privilege does

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10. The system according to claim 6, wherein said
5 server system further includes an end-message
transmitting unit, which is responsive to storage of the
original-image data and the reduced-data-quantity image
data of two stages in said storage unit, for
transmitting a message indicative of end of storage to
10 said client computer that transmitted the original-image
data.

an image search-condition input unit for inputting
15 image search conditions; and

20 said server system further includes:
 an image search-condition receiving unit for
receiving image search conditions that have been
transmitted from said image search-condition
transmitting unit;

25 a search unit for searching, on the basis of the
image search conditions received by said image search-
condition receiving unit, at least one item of data
among the original-image data and the reduced-data-

quantity image data of two stages stored in said storage unit; and

a search-result information transmitting unit for sending said client computer information relating to results of the search conducted by said search unit.

12. The system according to claim 11, wherein said server system further includes a second reception-privilege determination unit for determining whether the privilege to receive image data, which has been found as a result of the search conducted by said search unit, resides with said client computer;

said search-result information transmitting unit, in response to a determination by said second reception-privilege determination unit to the effect that the reception privilege resides with said client computer, sending said client computer the image data found as a result of the search conducted by said search unit.

13. The system according to claim 1, wherein said client computer further includes an image display unit for displaying an image representing by image data of a prescribed format; and

said server system further includes a format conversion unit for converting the original-image data that has been received by said original-image data receiving unit to a format that is capable of being displayed by said image display unit;

said image data generating unit generating the reduced-data-quantity image data having a format that is

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14. A server system capable of communicating with a client computer via a network, comprising:

- an original-image data receiving unit for receiving the original-image data transmitted;
- an image data generating unit, which responds to receipt of the original-image data by said original-image data receiving unit, for generating reduced-data-quantity image data of two stages representing at least two images possessing data quantities of at least two stages in each of which the quantity of data is less than that of the original-image data; and
- a unit for associating the original-image data, which has been received by said original-image data receiving unit, and the reduced-data-quantity image data that has been generated by said image data generating unit.

15. An image database registration system comprising:

- an image file input unit for inputting an image file which includes an additional-information recording area in which additional information has been recorded and an image-data recording area in which image data representing an image has been recorded;
- an additional-information reading unit for reading the additional information that has been recorded in the additional-information recording area included in the image file input from said image file input unit;
- an image data reading unit for reading the image

data that has been recorded in the image-data recording area included in the image file input from said image file input unit; and

5 a storage control unit for storing the additional information that has been read by said additional-information reading unit and the image data that has been read by said image data reading unit in a storage unit in association with each other.

16. An image database search system comprising:

10 a storage unit in which additional information, which has been recorded in an additional-information recording area of an image file, and image data, which has been recorded in an image-data recording area of the image file, are stored in association with each other;

15 an additional-information input unit for inputting additional information;

a search unit which, on the basis of the additional information that has been input from said additional-information input unit, retrieves the corresponding
20 image data from said storage unit; and

an image data output unit for outputting image data that has been found by the search conducted by said search unit.

17. A method of controlling the operation of a server
25 system capable of communicating with a client computer via a network, comprising the steps of:

receiving original-image data that is sent;

generating, in response to receipt of the original-

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5 data; and

18. An image database registration method comprising
10 the steps of:

15 image has been recorded;

reading the image data that has been recorded in
20 the image-data recording area included in the image file
that has been input; and

25 19. An image database search method comprising the
steps of:

storing additional information, which has been recorded in an additional-information recording area of

an image file, and image data, which has been recorded in an image-data recording area of the image file, in a storage unit in association with each other;

```
inputting additional information;
```

5 on the basis of the additional information that has
been input, retrieving the corresponding image data from
said storage unit; and

```

        outputting image data that has been found by
retrieval.

```

10 20. A recording medium storing a program for
controlling a server system capable of communicating
with a client computer via a network, said program
controlling a computer of the server system so as to:

```
receive original-image data that has been sent;
```

15 generate, in response to receipt of the original-
image data, reduced-data-quantity image data of two
stages representing at least two images possessing data
quantities of at least two stages in each of which the
quantity of data is less than that of the original-image

20 data; and

associate the original-image data that has been received and the reduced-data-quantity image data that has been generated.

21. A computer-readable recording medium storing a
25 program for registering image data in an image database,
said program controlling a computer of the image
database so as to:

input an image file which includes an additional-

ABSTRACT OF THE DISCLOSURE

Original images, large images, medium images and thumbnail images are registered with a server system. An original-image file is transmitted from a client
5 computer to the server system. The server system converts the format of the original-image file to generate a large-image file, generates a medium-image file, in which the quantity of data is less than that of the large-image file, from the large-image file, and
10 generates a thumbnail-image file, in which the quantity of data is less than that of the medium-image file, from the medium-image file. The original-image file, large-image file, medium-image file and thumbnail-image file are placed on one folder and stored in an image file
15 unit. After the folder containing the original-image file, etc., has been stored in the image file unit, the user of a client computer having access privileges is capable of accessing files such as the large-image file.

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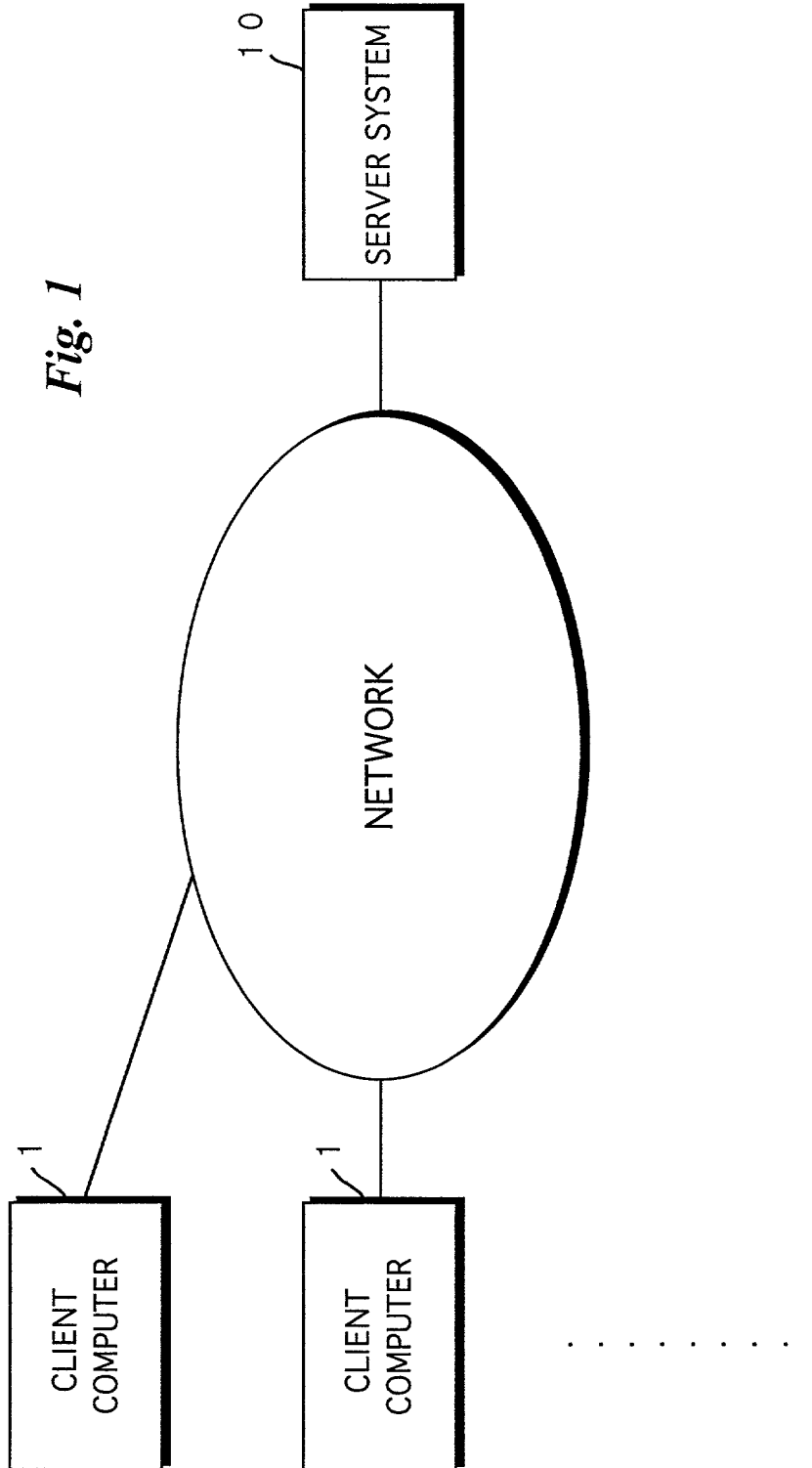


Fig. 2

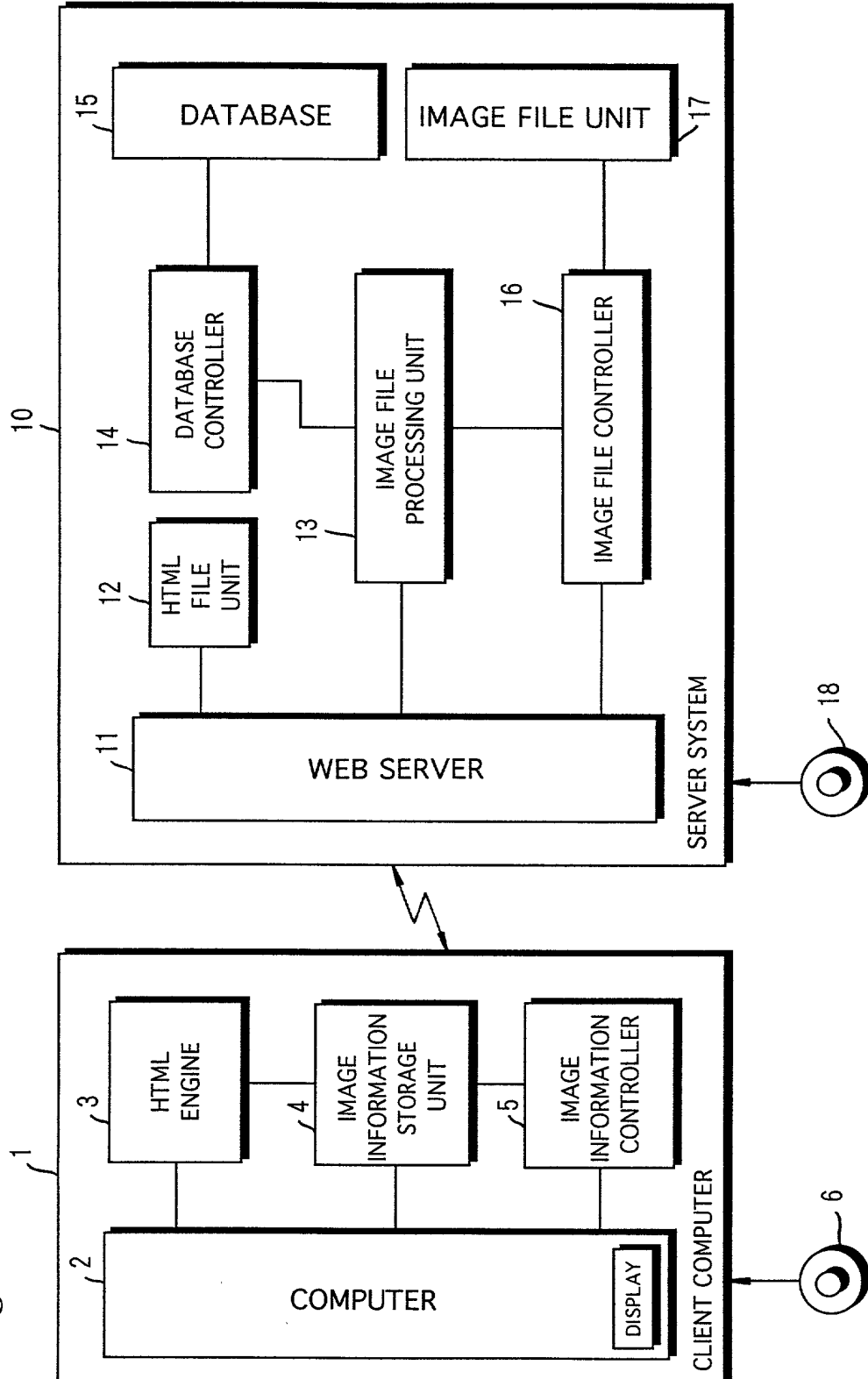


Fig. 3

USER TABLE	
User ID	USER ID
Group ID	GROUP NO.
UserName	USER NAME
Password	PASSWORD
EntryOK	PRIVILEGE TO ACCESS REGISTRATION PAGE (True/False)
SearchOK	PRIVILEGE TO ACCESS SEARCH PAGE (True/False)
ResultOK	PRIVILEGE TO ACCESS PAGE DISPLAYING LIST OG SEARCH RESULTS (True/False)
DetailOK	PRIVILEGE TO ACCESS DETAILED-INFORMATION PAGE (True/False)
BinaryOK	BINARY-ACCESS PRIVILEGE (True/False)

Fig. 4

NEXT-ID TABLE	
CurrentID	CURRENT RECORD NO.
NextID	NEXT RECORD NO.

Fig. 5

GROUP-ID TABLE	
GroupID	GROUP NO.
GroupName	GROUP NAME

Fig. 6

DATA TABLE	
RecordID	RECORD NO.
OwnerID	OWNER ID
NumOfBinary	NUMBER OF ATTACHMENT FILES
ImageInfo1	KEYWORD 1
ImageInfo2	KEYWORD 2
ImageInfo3	KEYWORD 3
ImageInfo4	KEYWORD 4

Fig. 7

ACCESS TABLE	
RecordID	RECORD NO.
AccessID0	GROUP NO. HAVING PRIVILEGE 0
AccessID1	GROUP NO. HAVING PRIVILEGE 1
AccessID2	GROUP NO. HAVING PRIVILEGE 2
AccessID3	GROUP NO. HAVING PRIVILEGE 3
AccessID4	GROUP NO. HAVING PRIVILEGE 4

Fig. 8

BINARY TABLE	
RecordID	RECORD NO.
OwnerID	OWNER ID
BinaryNum	BINARY-FILE NO.
FileName	FILE NAME
ByteSize	BYTE SIZE OF BINARY FILE

Fig. 9

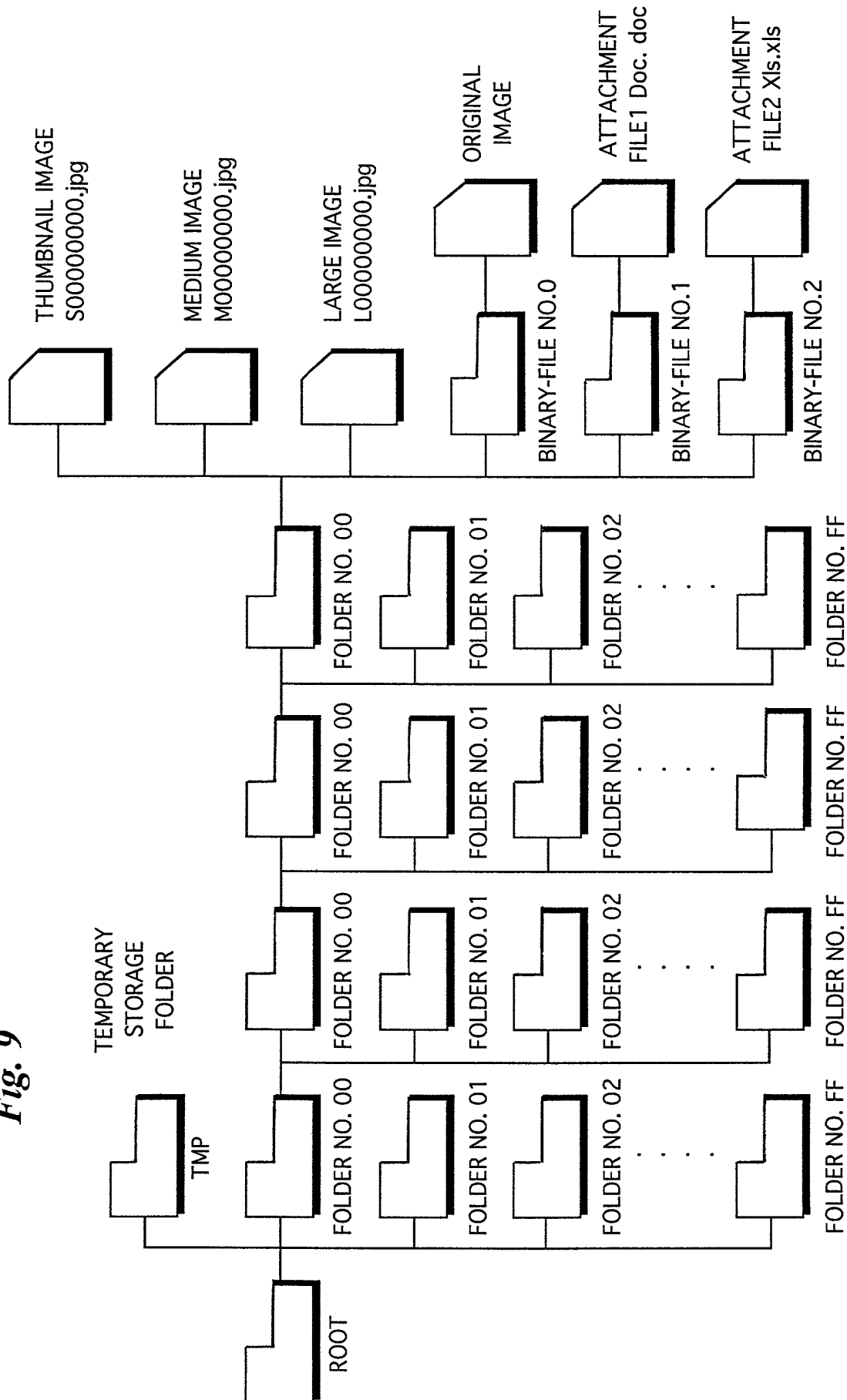


Fig. 10

DISPLAY OF MAIN-MENU PAGE

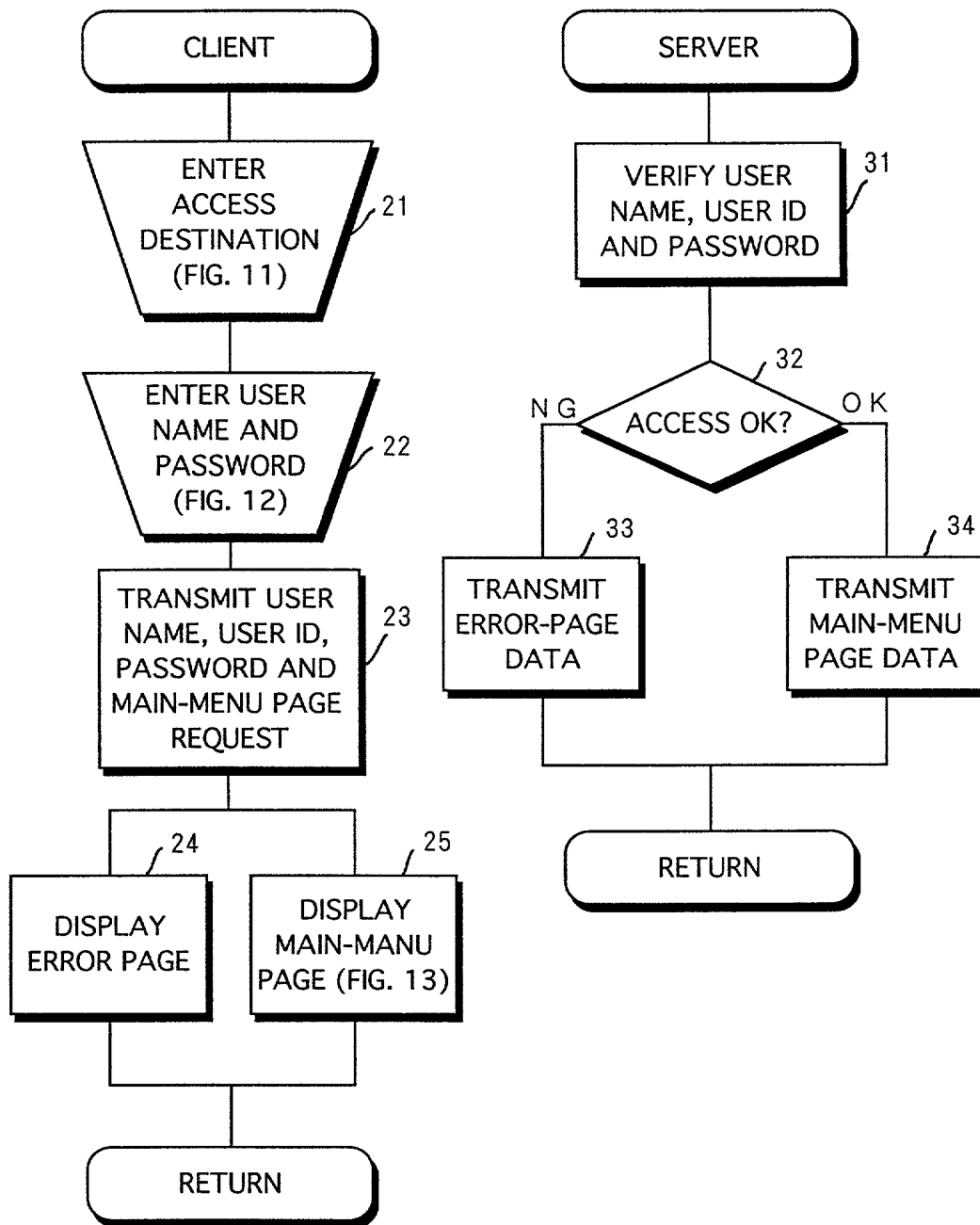


Fig. 11

W 1

ENTER ACCESS DESTINATION

A 1

A 2

Fig. 12

W 2

SYSTEM LOG-IN

USER NAME

PASSWORD

A 3

A 4

A 2

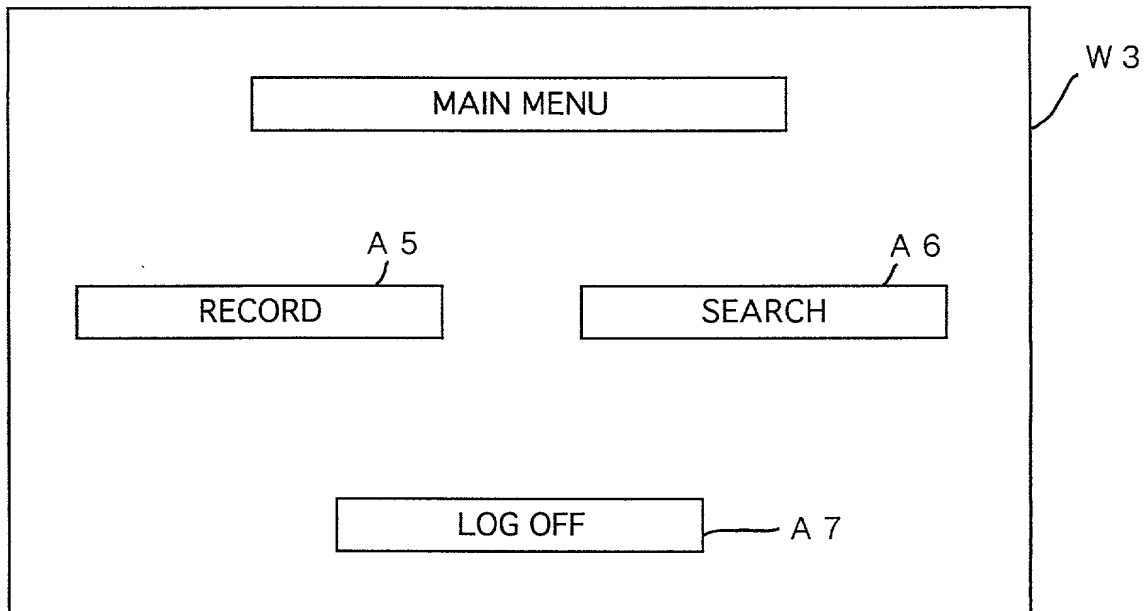
Fig. 13

Fig. 15

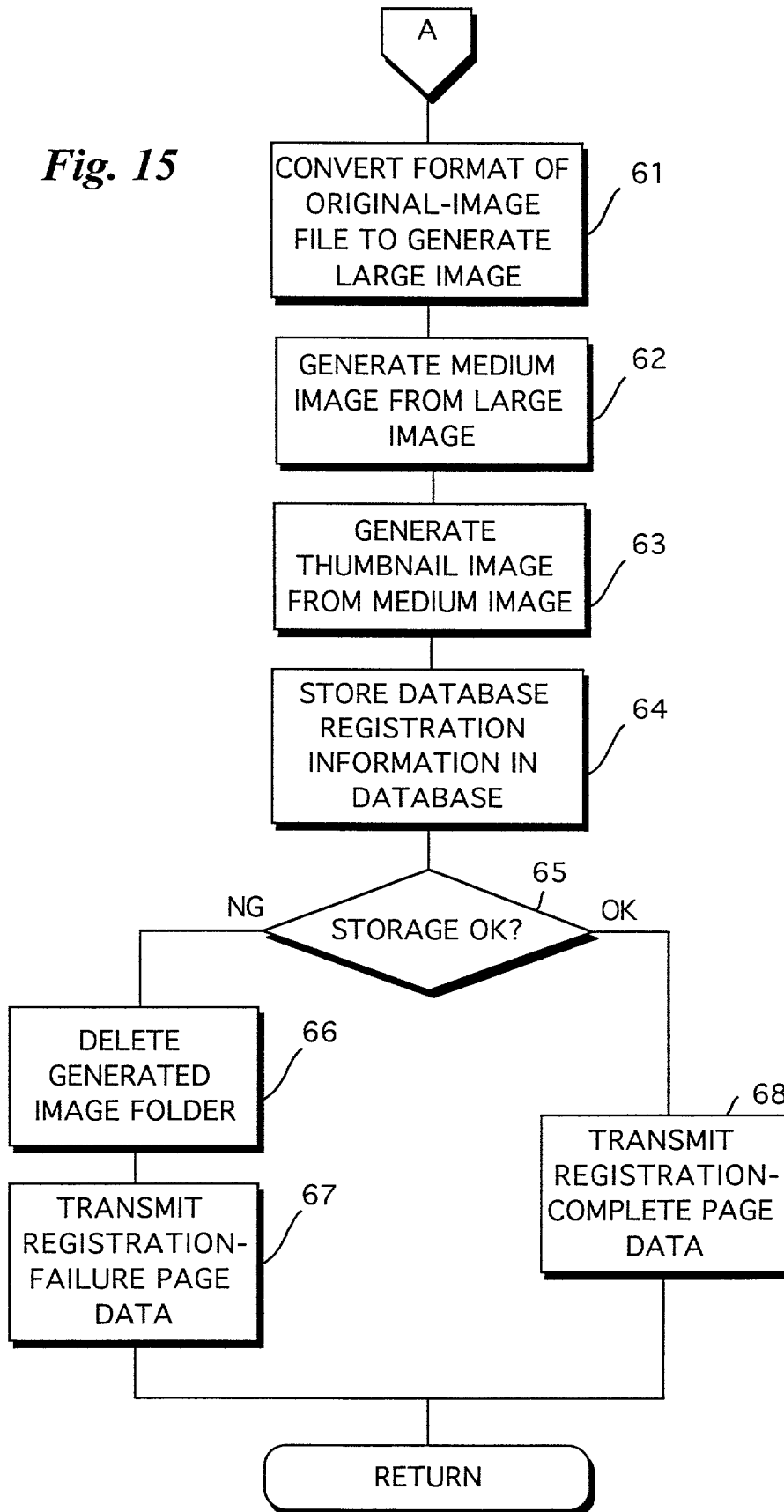


Fig. 16

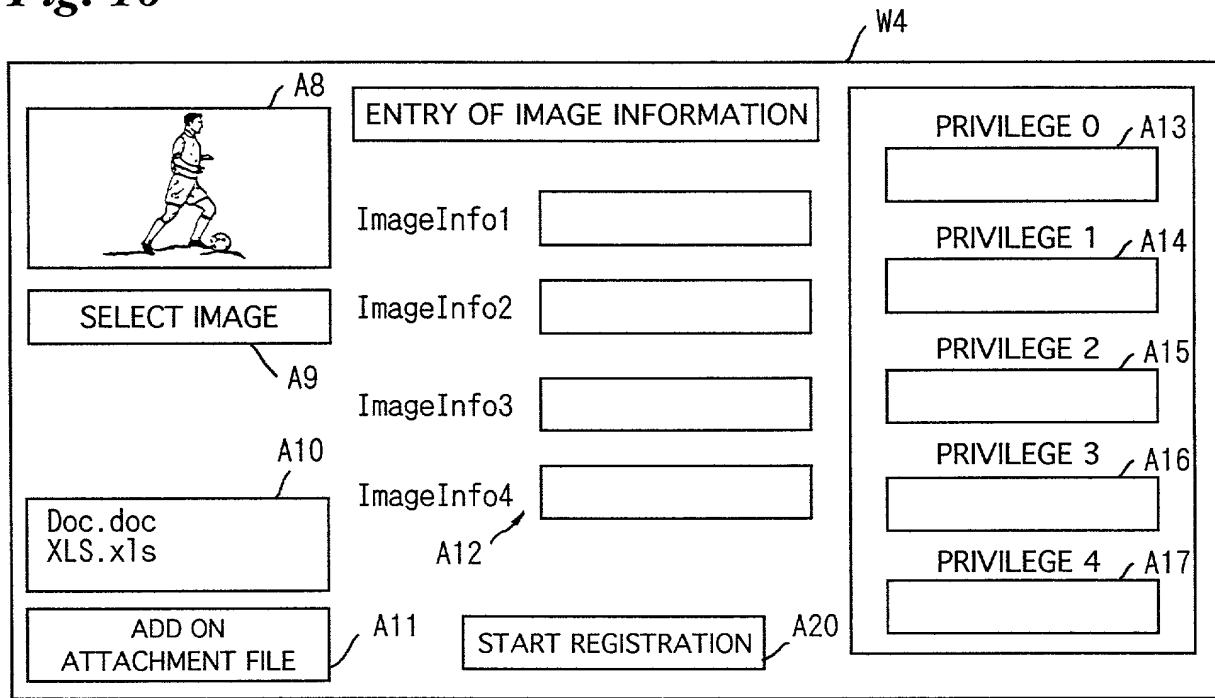


Fig. 17

SEARCH IMAGE FILES

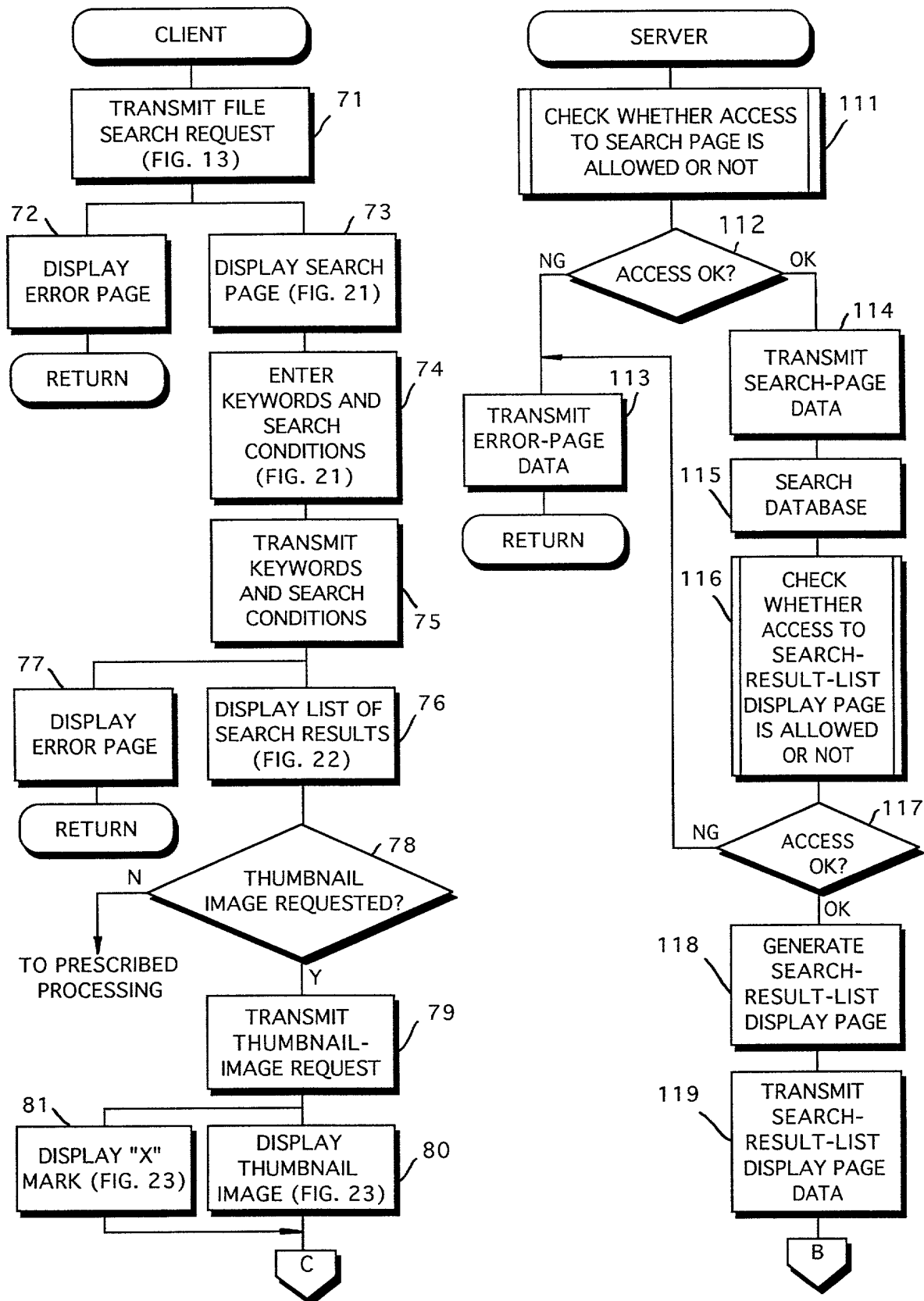


Fig. 18

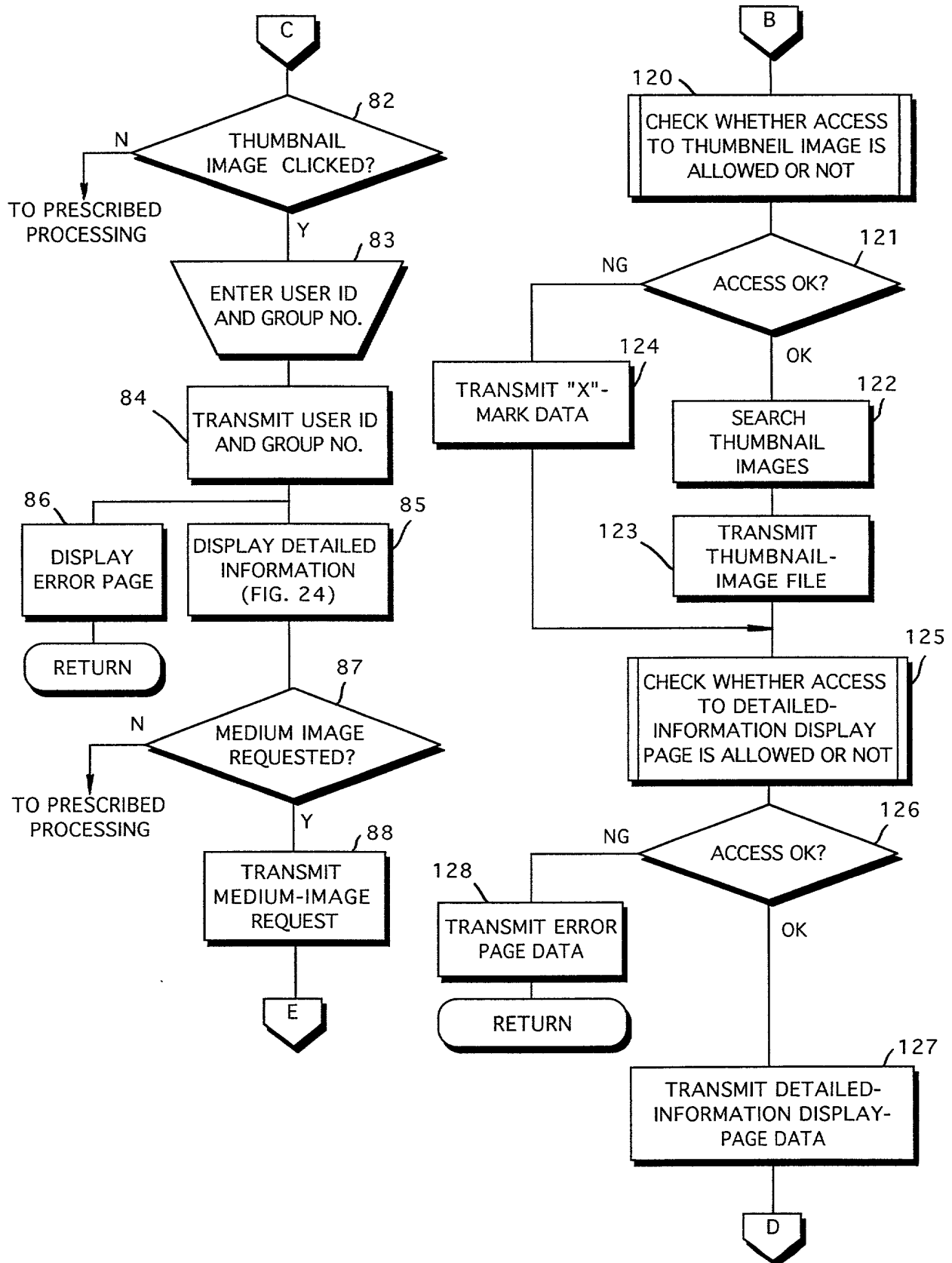


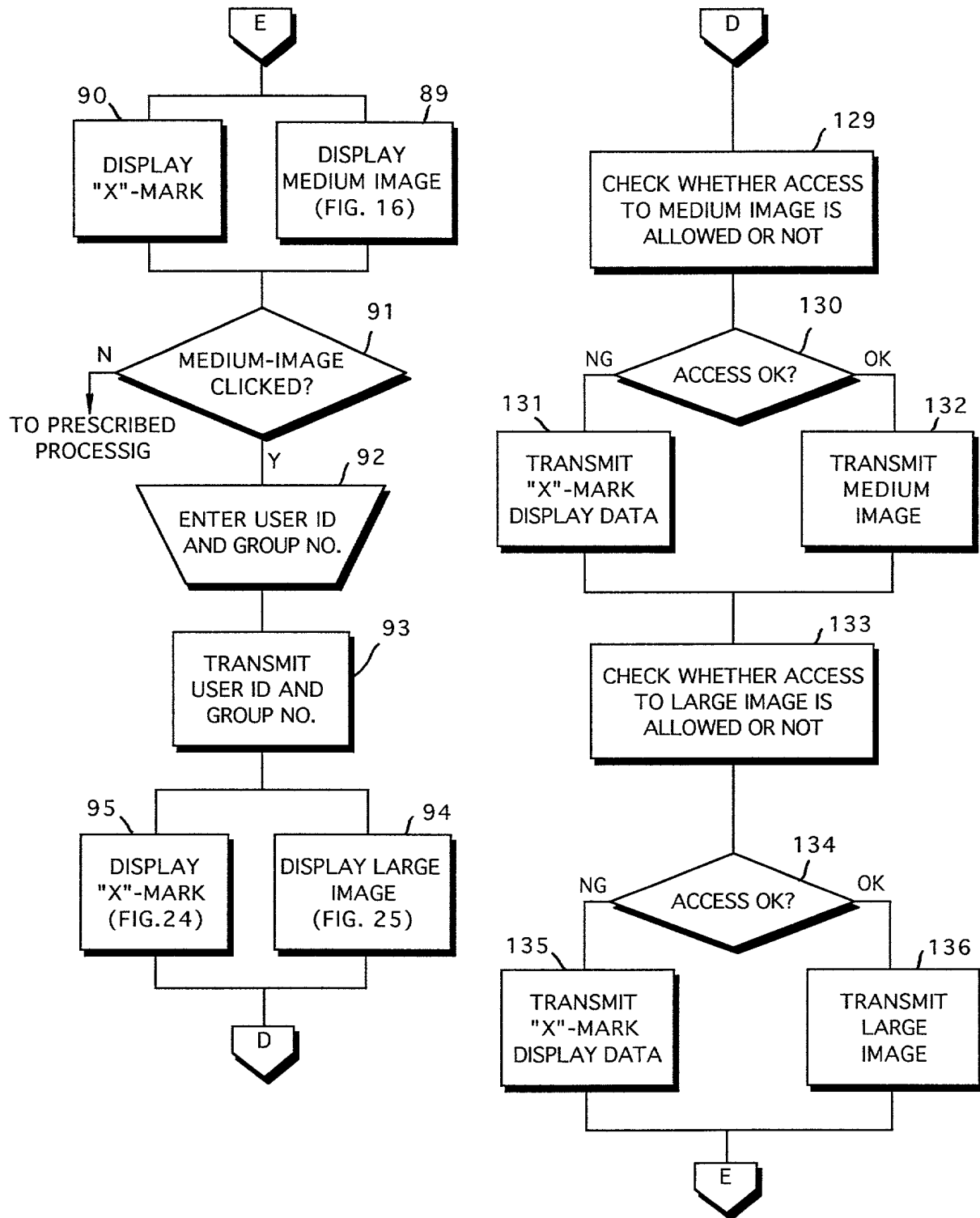
Fig. 19

Fig. 20

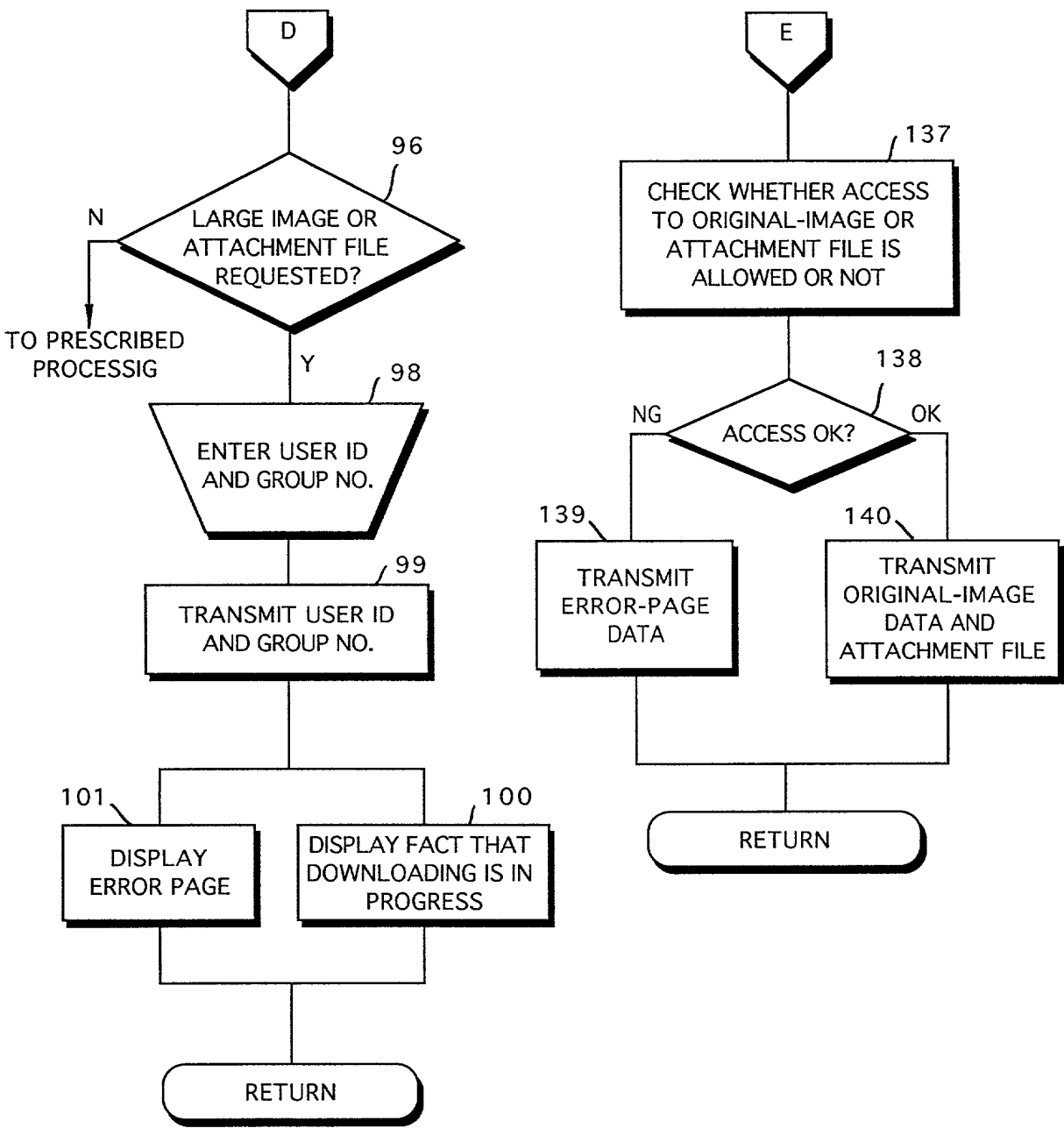


Fig. 21

W5

SEARCH

ImageInfo1	SOCCER A21	INCLUDE A25	AND A29
ImageInfo2	PERSON A22	INCLUDE A26	A30
ImageInfo3	A23	A27	A31
ImageInfo4	A24	A28	A32

A33

CLEAR

START SEARCH A34

Fig. 22

W6

LIST SEARCH OF RESULTS

	Info1	Info1	Info1	Info1
A35	SOCCER	SOCCER	SOCCER	SOCCER
A36	SPORTS	OUTDOOR PHOTOGRAPH	PERSON	SOCCER
A37	BALL	SOCCER	PERSON	

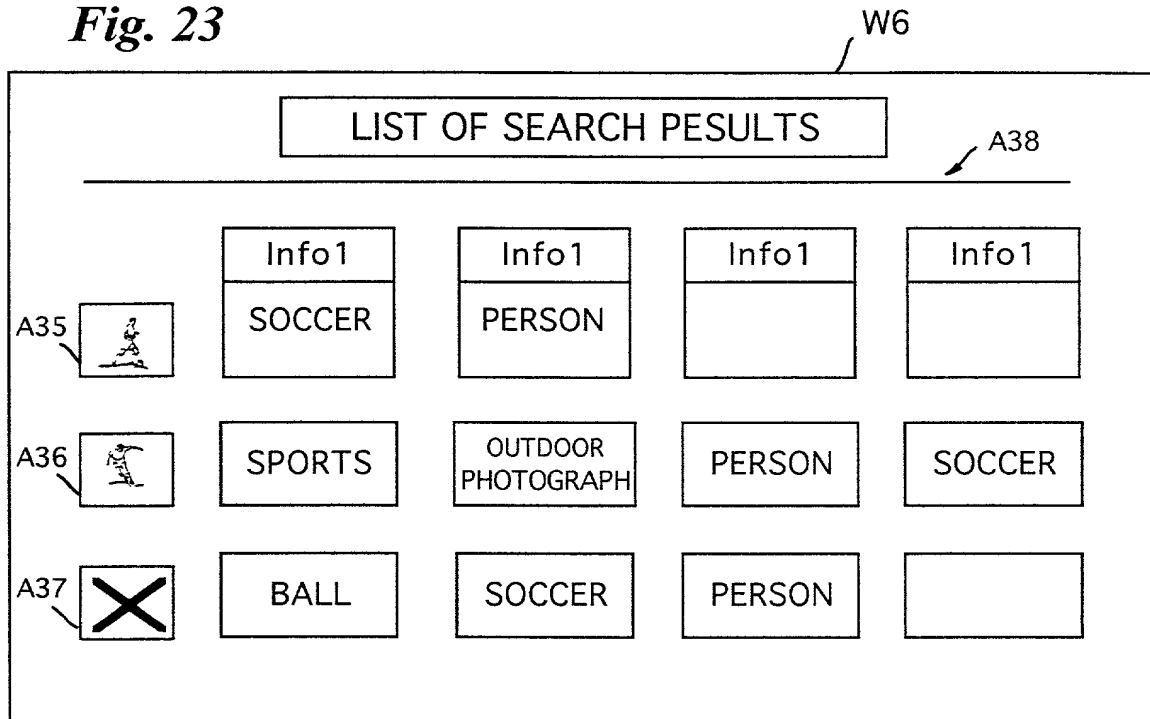
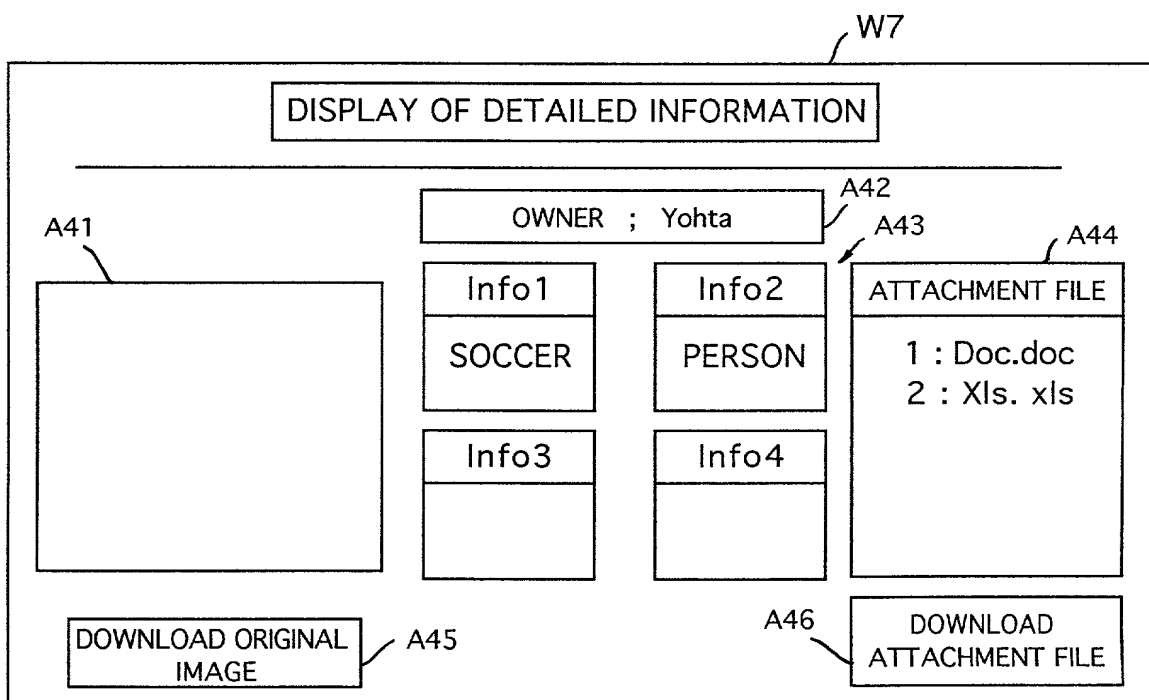
Fig. 23**Fig. 24**

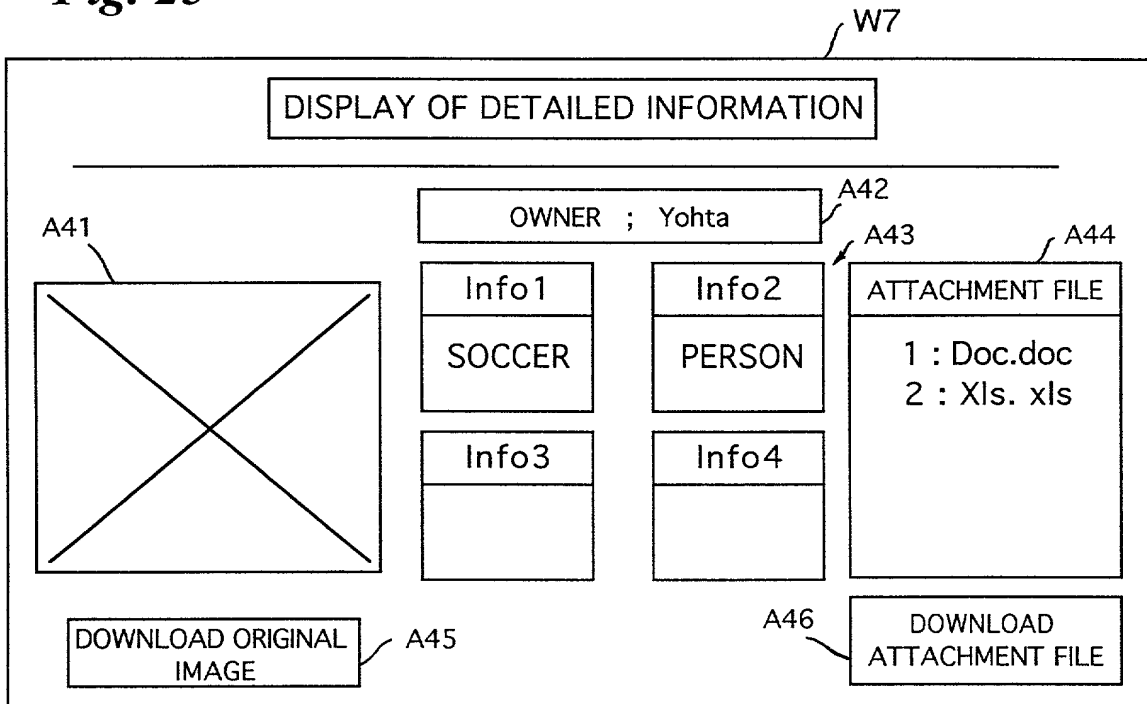
Fig. 25

Fig. 29

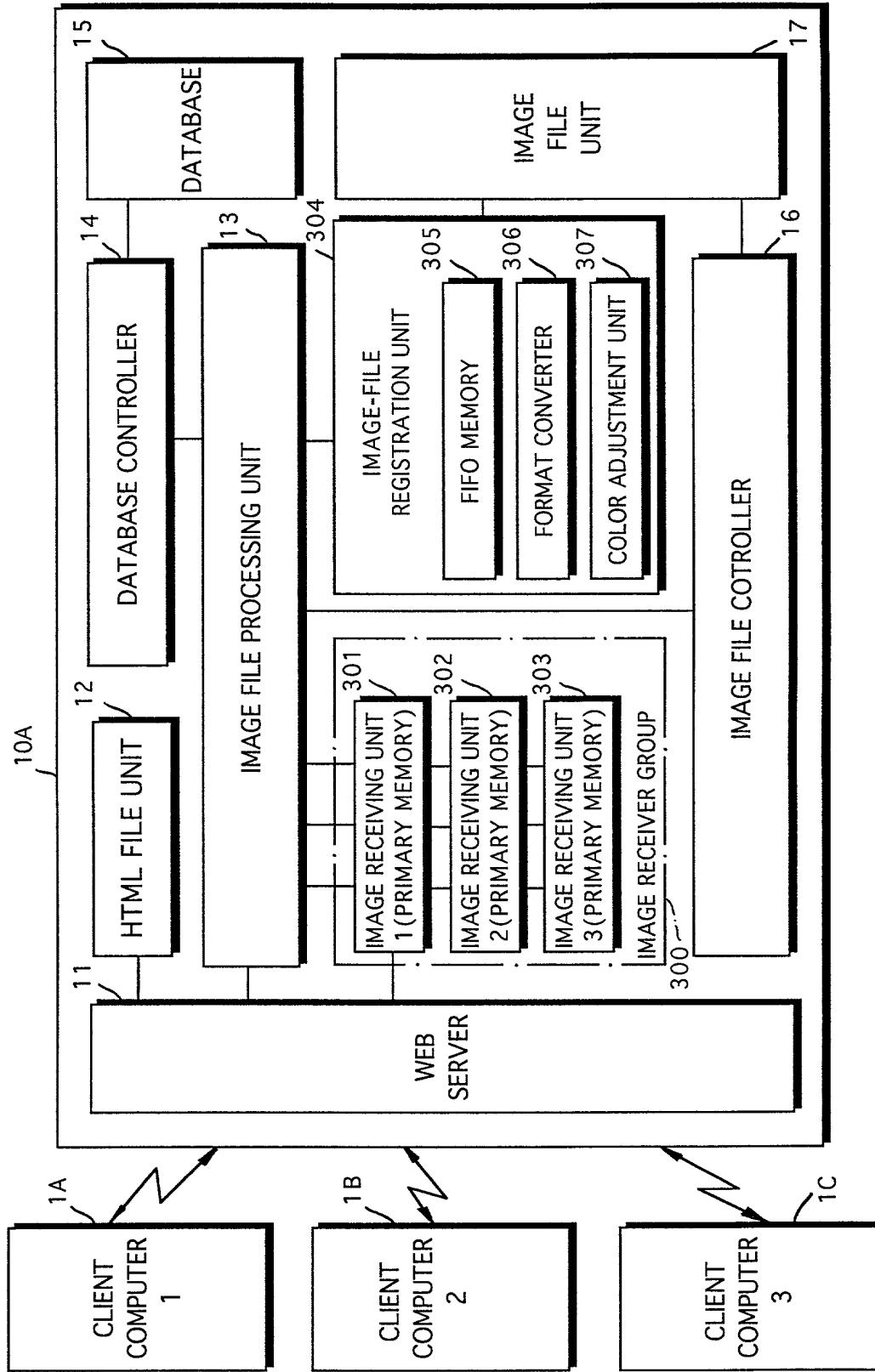



Fig. 30

Wi4



SELECT IMAGE

Doc.doc
XLS.xls

ADD ON
ATTACHMENT FILE

ENTRY OF IMAGE INFORMATION

ImageInfo1

ImageInfo2

ImageInfo3

ImageInfo4

☒ CONVERT FORMAT
(NSK-TIFF)

COLOR ADJUSTMENT LEVEL

START REGISTRATION

PRIVILEGE 0

PRIVILEGE 1

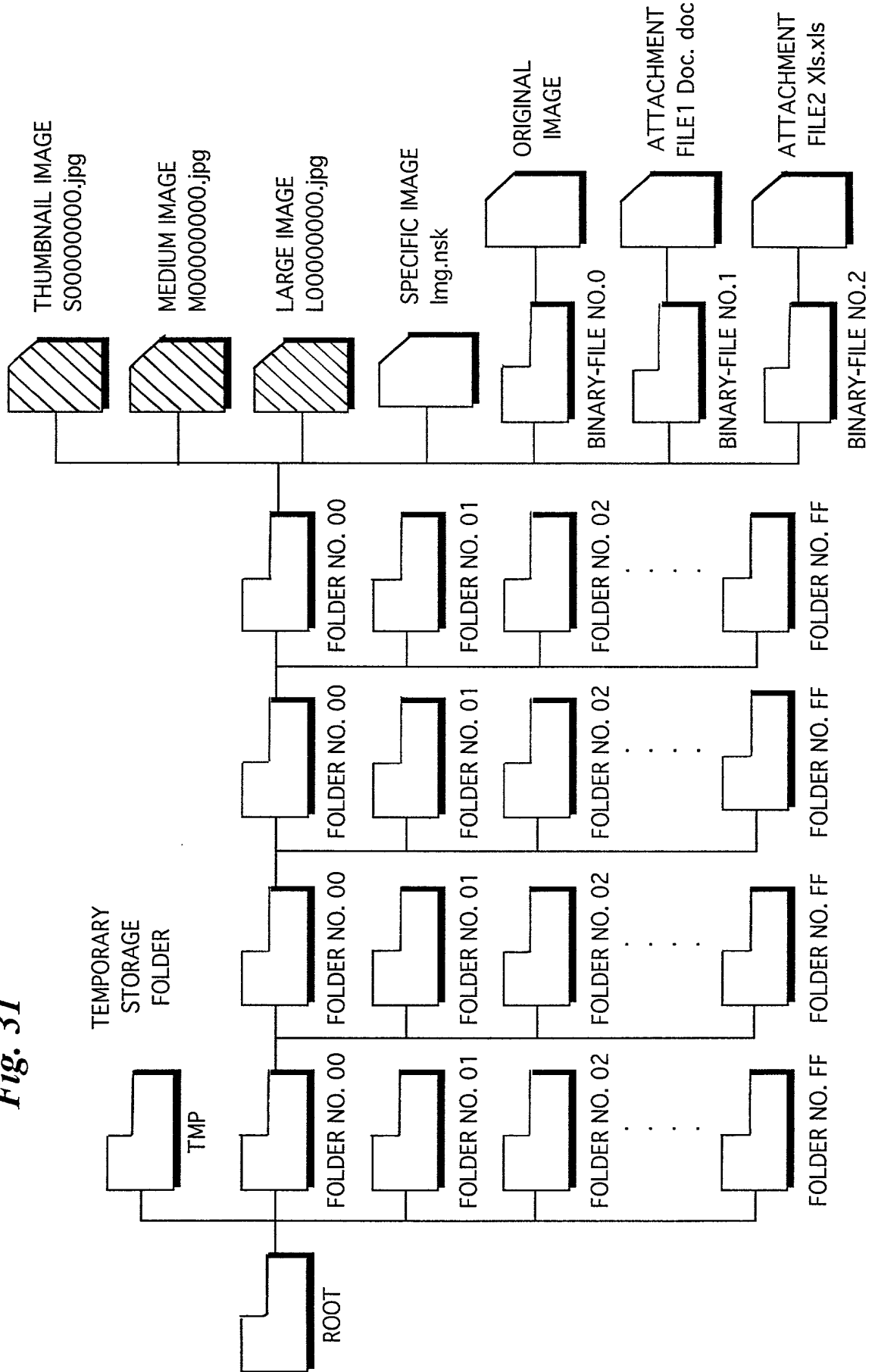
PRIVILEGE 2

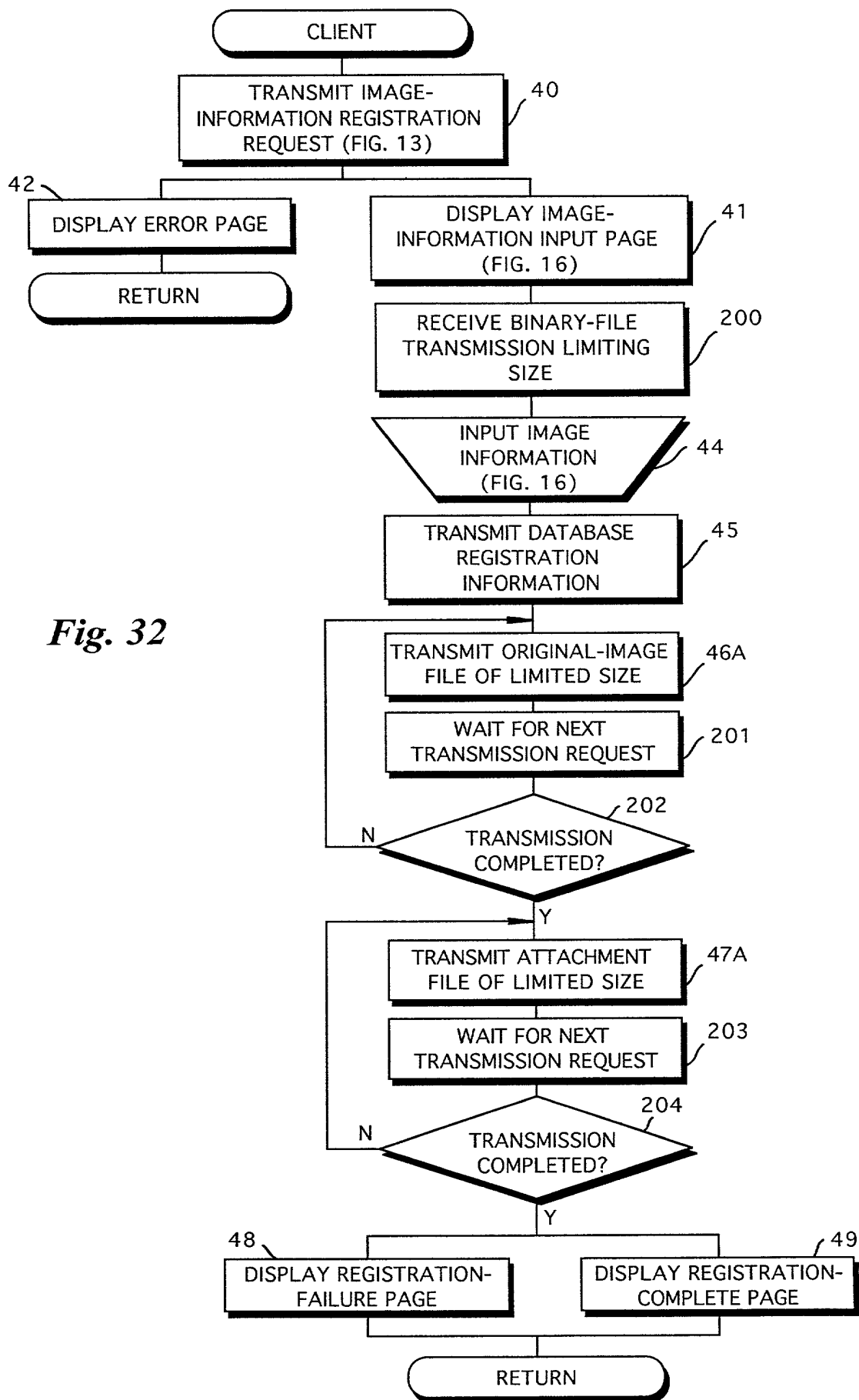
PRIVILEGE 3

PRIVILEGE 4

DocId: 3422460

Fig. 31





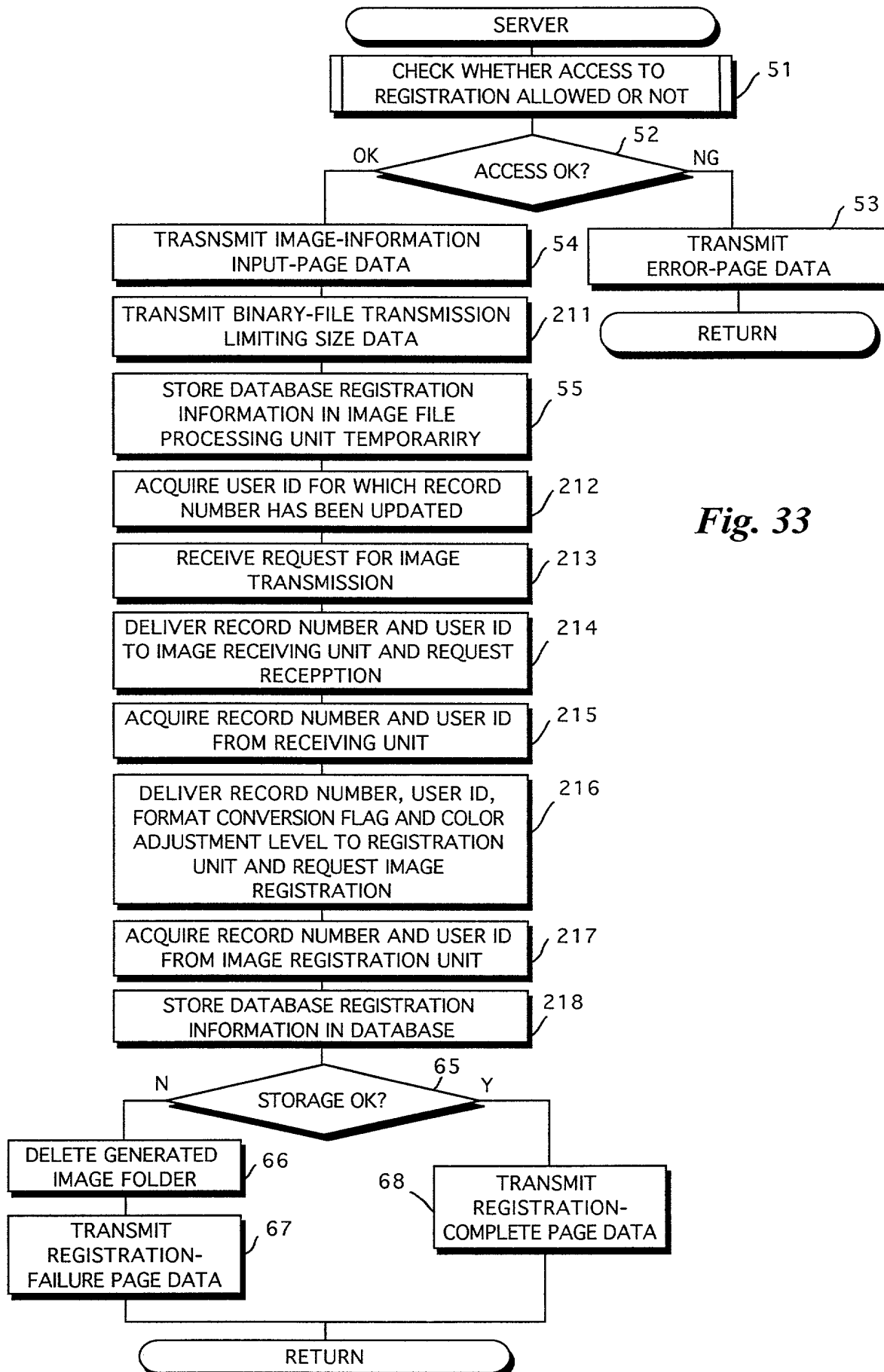
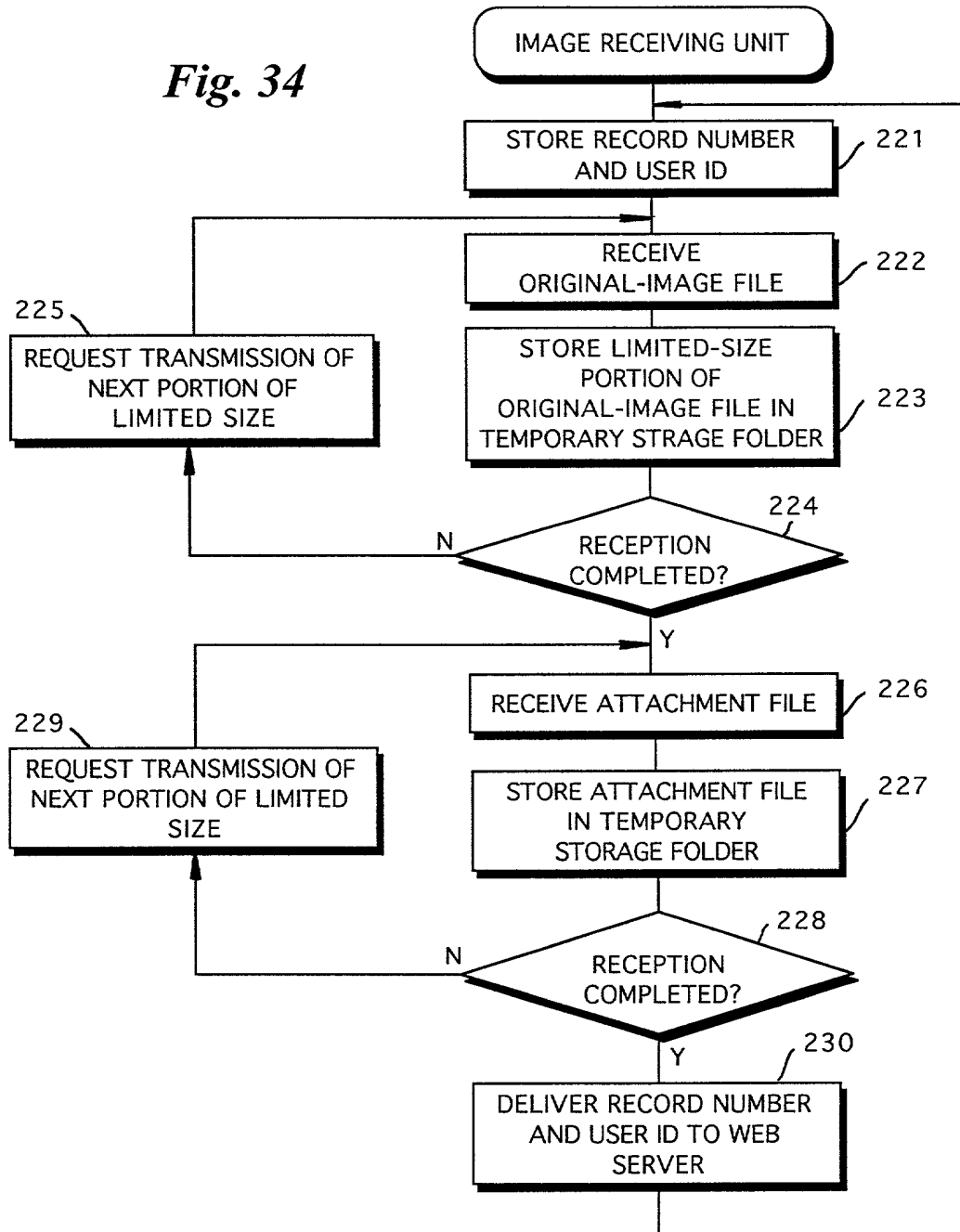


Fig. 34

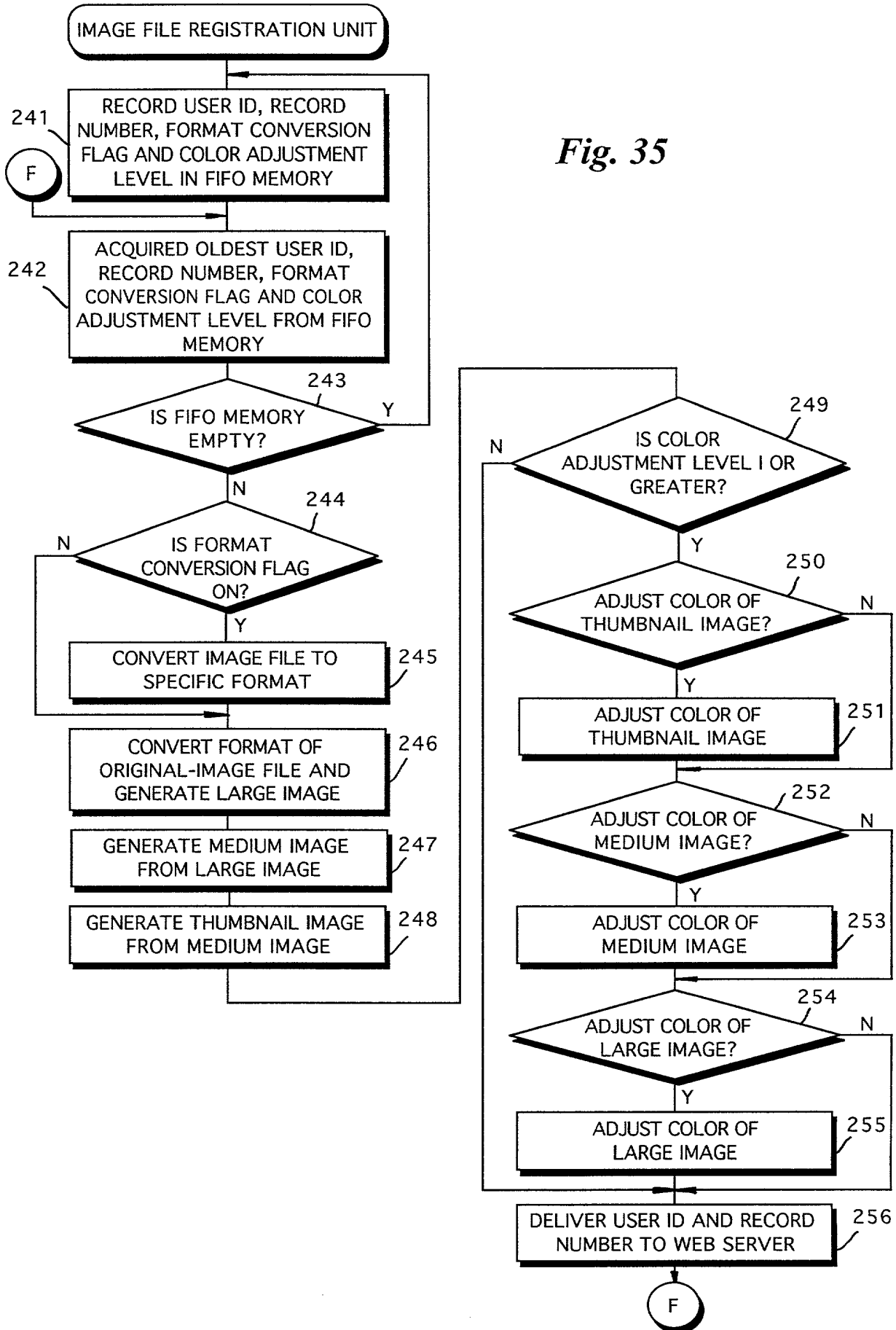


Fig. 36

W9

WHICH IMAGE DO YOU WISH TO DOWNLOAD?

A61 ☐ ORIGINAL-IMAGE FILE

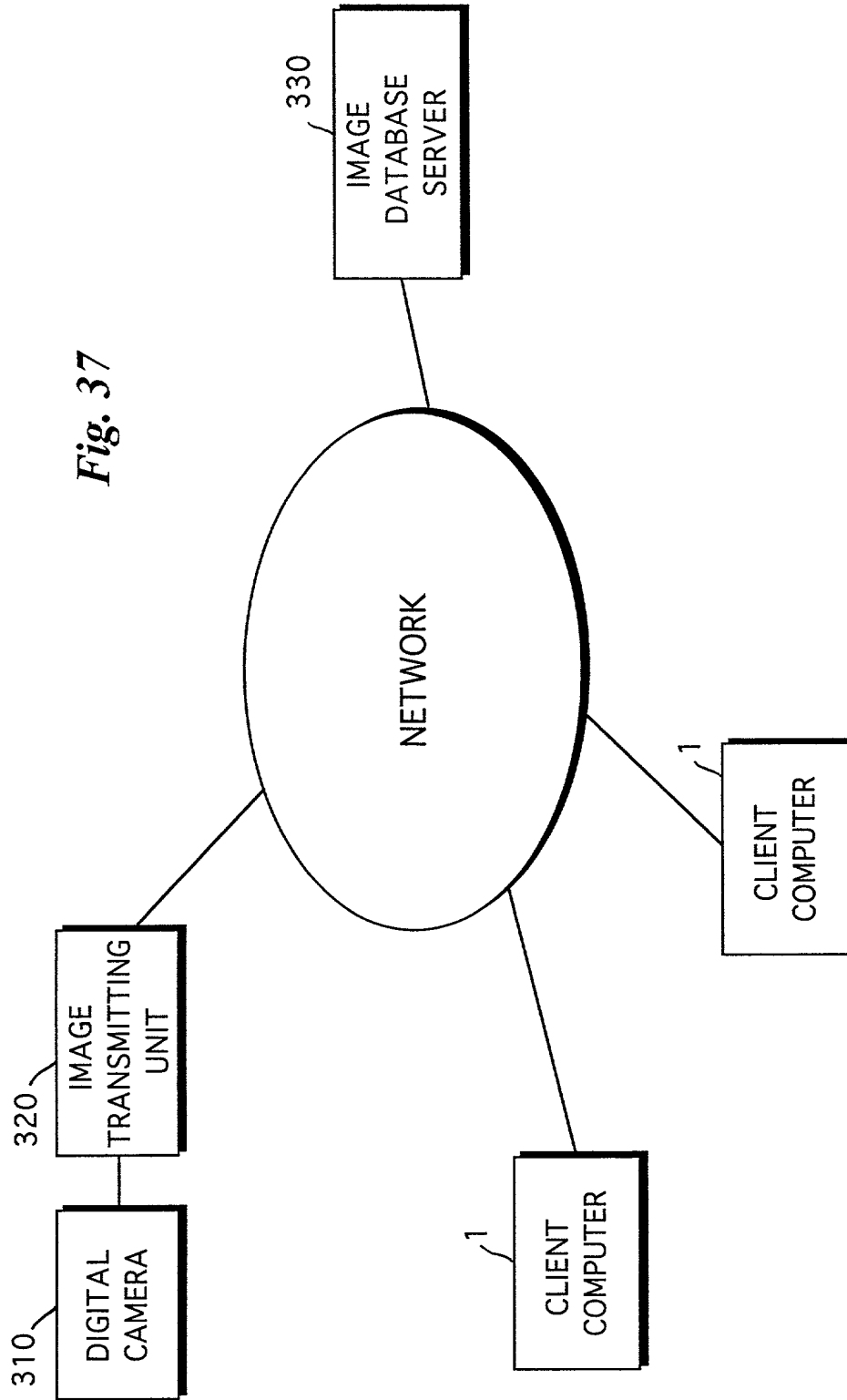
A62 ☒ NSK-TIFF FILE

A63 ☐ LARGE IMAGE

A64

OK

Fig. 37



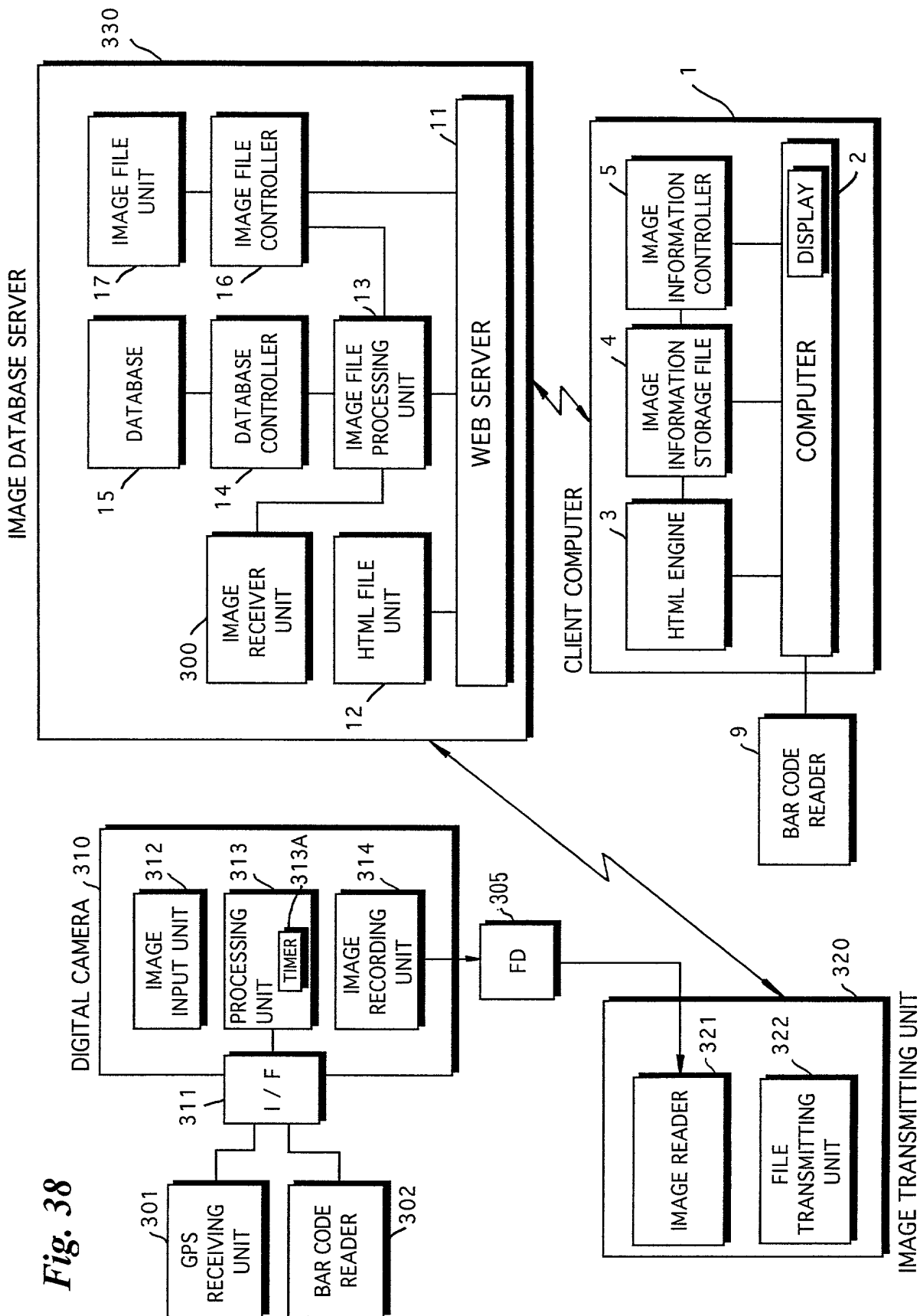


Fig. 41

BAR-CODE NO.
PRODUCT NAME (FinePix 700)
PRODUCT INFORMATION 1 (DIGITAL CAMERA)
PRODUCT INFORMATION 2 (PRICE)
PRODUCT INFORMATION 3 (INVENTORY)
PRODUCT INFORMATION 4

Fig. 42

IMAGE INDEX
BAR-CODE NO.
DATE OF PHOTOGRAPHY
POSITION INFORMATION

Fig. 42

CURRENT IMAGE INDEX
NEXT IMAGE INDEX

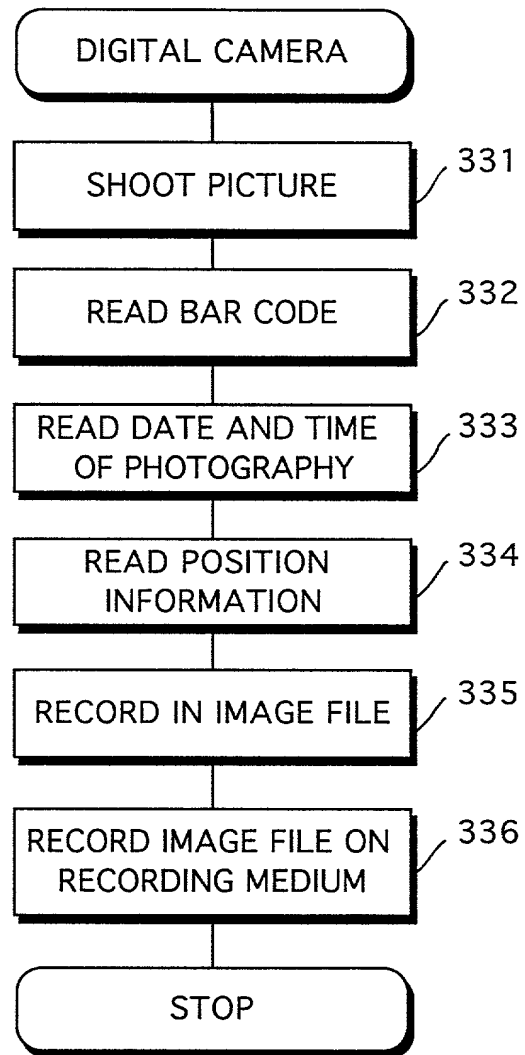
Fig. 43

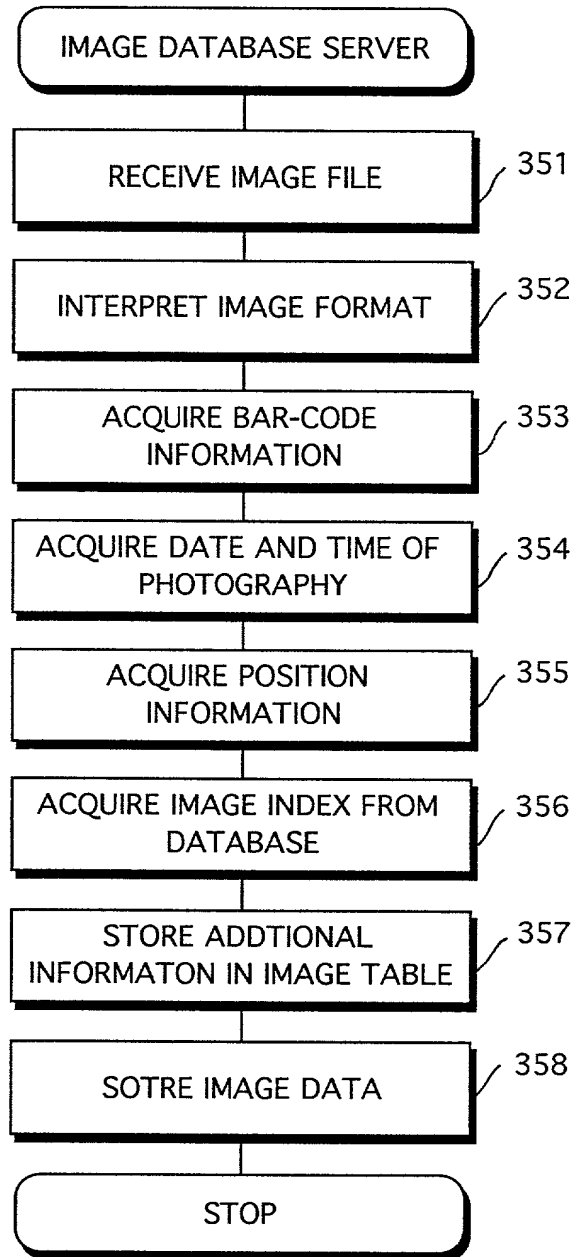
Fig. 45

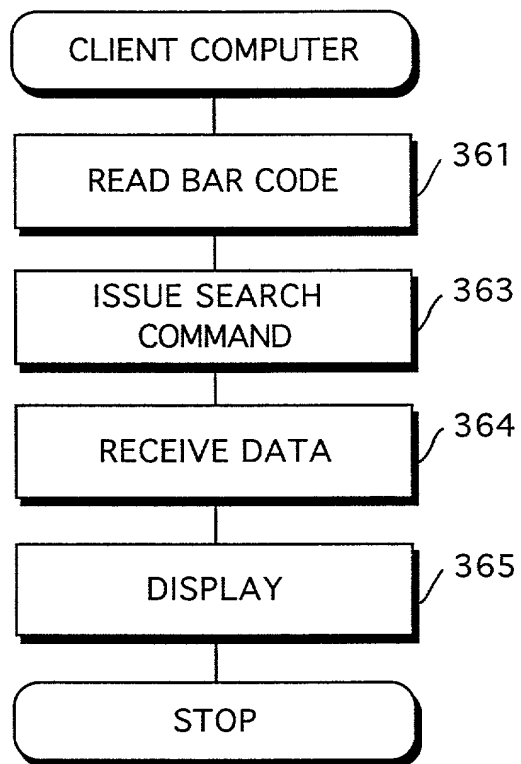
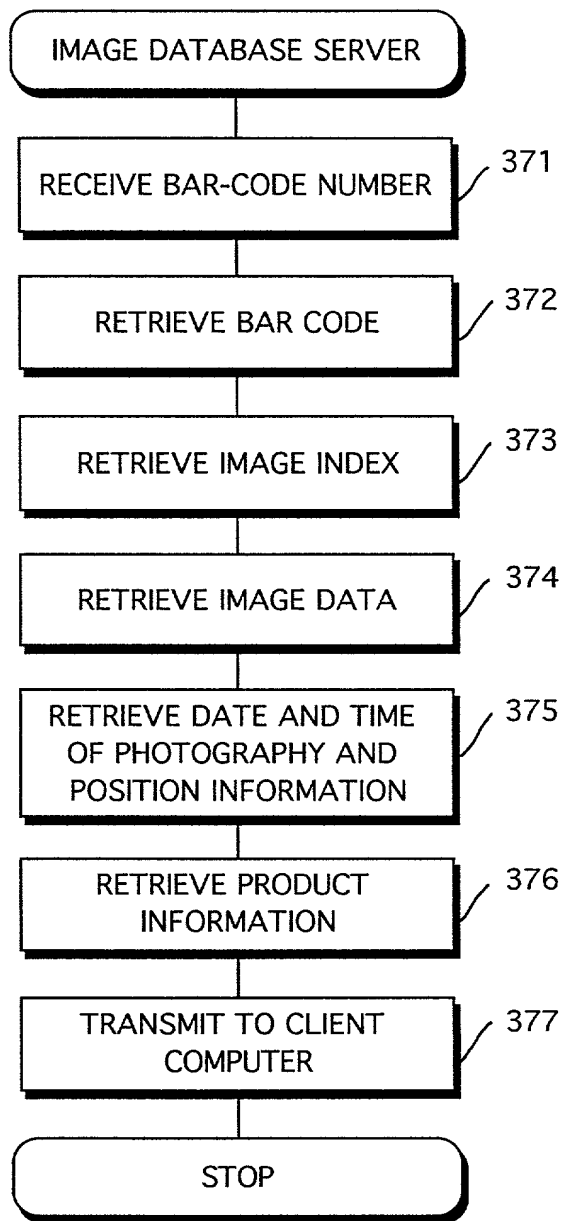
Fig. 46

Fig. 47

Application for United States Patent

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

IMAGE DATA COMMUNICATION SYSTEM, SERVER SYSTEM, METHOD OF CONTROLLING OPERATION OF SAME, AND RECORDING MEDIUM STORING PROGRAM FOR CONTROL OF SERVER SYSTEM

the specification of which:
(check one)

☒ (is attached hereto)
☐ was filed on _____,
as Application Serial No. _____
and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56*

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			priority claimed	
11-008097	Japan	14/01/1999	<input checked="" type="checkbox"/>	
(Number)	(Country)	(Day/Month/Year Filed)	yes	no
11-079569	Japan	24/03/1999	<input checked="" type="checkbox"/>	
(Number)	(Country)	(Day/Month/Year Filed)	yes	no
(Number)	(Country)	(Day/Month/Year Filed)	yes	no

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
--------------------------	---------------	--

Power of Attorney: As a named inventor, I hereby appoint Sean M. McGinn, Reg. No. 34, 386, and Frederick W. Gibb, III, Reg. No. 37,629, as attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. All correspondence should be directed to McGinn & Gibb, P.C., 1701 Clarendon Boulevard, Suite 100, Arlington, Virginia 22209. Telephone calls should be directed to McGinn & Gibb, P.C. at (703) 294-6699.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

